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ABSTRACT

Standord University's Institute for Communication Research was asked in 1968 to conduct an evaluation of a new instructional television (ITV) system in El Salvador: to study the effects of ITV on El Salvador's school system; to derive conclusions from the experience that might help guide other nations interested in applying instructional technology; and to contribute through research to the development of the ITV system. The first chapter identifies the context of the evaluations and traces the origins of El Salvador's ITV system. The second chapter presents the results of four years of research on learning, while the third chapter presents a picture of student attitudes across the four years of research. Students' educational and occupational aspirations are summarized in the fourth chapter, and background information of the students, their schools, and their communities is presented in the fifth chapter. The next few chapters report studies of teacher attitudes and behavior, studies of the efficiency and cost of the new system, and an administrative history of ITV. A final chapter reviews El Salvador's ITV system and concludes with a brief discussion of some alternative strategies for the use of instructional technology to expand educational opportunity. (Author/SH)

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TELEVISION AND EDUCATIONAL REFORM IN EL SALVADOR

Final Report

ROBERT C. HORNIK
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JOHN K. MAYO
EMILE G. McANANY
WILBUR SCHRAMM

RESEARCH REPORT NO. 14

This is the last in a series of research reports on the Educational Reform of El Salvador, and especially its use of instructional television. This report has been prepared by members of the Institute for Communication Research, Stanford University, on behalf of the Academy for Educational Development, under contract with the U.S. Agency for International Development.

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5. Measuring Educational Development through Classroom Interaction. Research Memorandum No. 1. September, 1969 (Wilbur Schramm).*

6. Parents Talk about ETV in El Salvador. Research Memorandum No. 2. October, 1969. (Luis F. Valero Iglesias, Emile G. McAnany).*

7. "Feedback" for Instructional Television. Research Memorandum No. 3. December, 1969 (Wilbur Schramm).

9. Research and Evaluation in the El Salvador Project of Educational Reform: What is Being Tested and Why. Research Memorandum No. 4. January, 1970.*

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IN EL SALVADOR

Final Report

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August, 1973

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INTRODUCTION

In January, 1969, Oscar Miguel Ramirez, a young Salvadoran, was about to enter the seventh grade. At fourteen, Oscar had already acquired a great deal of practical experience by working in his mother's small grocery store, occasionally helping his father at the coffee finca, and frequently looking after his five younger brothers and sisters. Because he had also been a good student in primary school, Oscar's parents had high hopes for him. Oscar's father foresaw the day when his son would work with him at the finca; not by starting in the fields as he had done and working his way up over many years, but rather by first finishing school and by then becoming a machinist or even an accountant in the manager's office. Oscar's mother, never one to challenge her husband's feelings on such a subject, still hoped that her son might someday study at the university and become a doctor.

Despite his good sense, Oscar was regarded somewhat suspiciously by many of his parents' relatives and friends. Neither they nor their children had finished primary school, and Oscar's ambition both mystified them and made them envious. They questioned the usefulness of so much expensive schooling, and they hinted that too much education might make Oscar selfish and ashamed of his rural origins.

Oscar's small town had really not changed much during his lifetime. Only the plaza and a few streets surrounding it were paved; water and electric power were erratic, and in the dry season everything was covered with dust. Except for staple groceries (rice, beans, candles, soap, etc.), most townspeople preferred to travel an hour and a half by bus to the capital for their weekly shopping. Oscar and his friends were disappointed that the town still had no movie theater, and for this reason they, too, liked to go to the capital whenever enough time and money could be found. Very few of Oscar's teenage schoolmates planned to remain in their hometown much longer; the opportunities and diversions of the city were much more attractive to them.

The secondary school Oscar was about to enter was an old adobe house that the government had rented from private owners for the last ten years. It had six rather small rooms and shuttered windows that let in little daylight and made the air incredibly stuffy during the hot months. Inside, each classroom was filled with students' tables and benches which extended from the back wall to within inches of the teacher's desk. Behind the teacher's desk was mounted a large blackboard, a religious picture, and a calendar distributed by one of the country's soft drink bottlers. Spread sparsely around the walls were portraits of Salvadoran heroes, a map of Central America, and a few student drawings. Aside from the books and miscellaneous pieces of science equipment which had been donated over the years by local patrons and former teachers, the school had very few resources. Most materials were provided by the students' parents.

Unlike Oscar's primary teachers who lived in town and were well known by most townspeople, the secondary school instructors commuted from the capital. Some came and went daily in a car pool; others arrived Monday morning and stayed through Friday afternoon, boarding at local homes during the week. This was a lifestyle students had come to expect of their teachers; indeed, it was the way many students would have to live if they chose to continue their education beyond the ninth grade.

Most of the teachers were young men who would rather have been assigned to a city school. Lacking seniority and political connections, they had ended up in the countryside. Despite displeasure with their assignments and their adherence to rote teaching methods, the rural teachers were hardworking and friendly. The majority were from the rural areas themselves and they thus had some empathy for the community and for the young people they taught.

As the beginning of the new school term approached, Oscar looked forward anxiously to meeting his new teachers and classmates. Only half of his small sixth grade class had decided to enter the seventh grade; the other half was either picking coffee or looking for work in the capital. This meant that most of Oscar's new classmates would be from neighboring towns. He was used to new faces, however. He, too, had transferred schools a number of times, and he had repeated the third grade because the director of the school did not believe he was qualified to advance. Had he not lost touch with his original schoolmates, Oscar probably would have been surprised to learn that of the forty students who began first grade with him, fewer than five were now ready to begin seventh grade.

Oscar had received good marks in the last two years of primary school. He had always been neat and attentive, his handwriting was polished, and perhaps most important of all, he had learned how to remember the facts his teachers dictated in class. Memorization had been the key to his success.

Starting in 1968, stories began appearing in the newspapers that the government had started an educational reform. Rumors spread that new schools would be built, that the curriculum would be changed and that instructional television would soon replace many classroom teachers at the secondary level. Amid much speculation, it was no wonder that Oscar was excited when he learned on the first day of school that his class would be one of the first to have television.

For the next three years, Oscar and a thousand students like him would be pioneers on a project to transform their country's educational system. How these pioneers fared with television and other elements of El Salvador's Educational Reform is the subject of this report.

Scope of this Report

When El Salvador's Educational Reform began to take shape in 1968, USAID, through the Academy for Educational Development, asked Stanford University's Institute for Communication Research to conduct a comprehensive evaluation of the new instructional television (ITV) system. Three objectives were defined for the evaluation: (1) to study the effects of ITV on El Salvador's school system; (2) to derive general conclusions from the experience that might help guide other nations interested in applying instructional technology; and (3) to contribute through the research to the development of the ITV system itself.

The evaluation objectives were translated into specific research areas to guide the collection of data over four years. These areas are introduced below, along with the chapters of this report which deal with them.

The setting: To identify the context of the evaluation and to trace the origins of the ITV system, an overview of ITV in El Salvador's Educational Reform is provided in Chapter I.

Student learning: According to El Salvador's educational planners, ITV was to play a major role in helping classroom teachers upgrade the quality of their instruction. Consequently, the evaluation emphasized student learning. Two aspects of learning were measured: basic academic skills and course achievement. In the four years of research, the learning performance of three successive generations (cohorts) of students were analyzed. For the first cohort (A), which entered seventh grade in 1969 and which was followed until it completed ninth grade in 1971, comparisons were made between students in reform classrooms with ITV and students in classrooms taught in the traditional way. For Cohorts B and C (entering seventh grade in 1970 and 1971, respectively, when most of the reform programs had spread throughout the country) the comparisons were made only between Reform students with and without ITV. The results of these studies are found in Chapter II.

Student attitudes: Measures of student attitudes toward ITV and school in general were also repeated throughout the four years of research. They helped form a composite picture of the changing

Salvadoran students and they provided useful background information with which to interpret the students' learning performance. Chapter III presents the analyses of student attitudes.

Student aspirations: Because Salvadoran planners conceived of the Educational Reform as one way to expand their country's supply of middle level technicians, students' educational and occupational aspirations were monitored continuously. In addition, a special study examined student aspirations in relation to parental attitudes and another followed up the first group of ninth grade graduates. All these investigations are summarized in Chapter IV.

Community and classroom influences on students: Along with the collection of learning and attitude data, background information on the students, their schools, and their communities was collected. Such information permitted the researchers to see how students were affected by different environments and to determine what kind of students changed most in the course of the Reform. Student background data is referred to throughout the learning, attitude, and aspiration chapters, as well as in Chapter V, which deals predominantly with classroom and community data.

Teacher attitudes and behavior: Resistance to educational technology by classroom teachers has been a contributing factor to its lack of success in many countries. Therefore, a major concern of the research was to learn how teachers felt about the changes that were taking place under the Reform, the areas in which they were experiencing particular difficulties, and their attitudes toward teaching with television. In addition, a special classroom observation study was undertaken to see whether teachers' classroom methods were changing under the Reform. Results of the teacher studies are reported in Chapter VI.

Efficiency and costs of the new system: By eliminating tuition in grades 1-9 and by liberalizing enrollment and promotion policies, El Salvador's educational planners wished to increase the size of their school system and make it more efficient. Appropriate archival and survey data were gathered to see how enrollment, efficiency, and socioeconomic characteristics of Salvadoran schools were changed by such policies and to determine what their effect was on the unit costs of the ITV system. The results of these studies, along with a summary of the cost analysis of the ITV system, are presented in Chapter VII.

Administrative history: Evaluation studies have often overlooked the most crucial aspects of a project's success or failure because they did not take into account the ability of administrators to identify and resolve problems. Accordingly, an administrative history was compiled from many data sources to shed light on the major decisions and problems that affected the development of the ITV system in El Salvador. The major conclusions of this work are reviewed in Chapter VIII.

Looking ahead: In Chapter IX, the major accomplishments of El Salvador's ITV system are reviewed and questions are raised concerning the premises of the Educational Reform and its relevance to other countries. Noting that El Salvador relied on ITV to help reform its school system, the report concludes with a brief discussion of some alternative strategies for the use of instructional technology to expand educational opportunity.

Chapter I

Television and Educational Reform: an Overview

The Central American republic of El Salvador is among the smallest and most densely populated countries of the world. With 3.5 million inhabitants crowded into a land area roughly the size of New Jersey, and an annual rate of population growth estimated to be between 3.3 percent and 3.7 percent (1), the nation's limited resources are spread thinner with each passing year. Furthermore, the supply of arable land was exhausted some time ago and, although agricultural production has improved, El Salvador has had to increase markedly its imports of basic food commodities in recent years. Despite such imports, the most recent study of nutrition levels revealed the majority of the population remains deficient in both calorie and protein consumption(2).

Compounding the pressure of population growth in El Salvador are a broad range of economic and social problems common to developing countries. The wealth of the country is concentrated in relatively few hands, while the vast majority of the people live at or near the subsistence level. A survey of land ownership conducted in 1967 revealed that a majority of El Salvador's productive land was controlled by less than two percent of its land holders (3). These individuals exercise great economic and political power. Their large estates produce the nation's main export crops, coffee and cotton, and they employ many thousands of agricultural workers. All told, approximately 60 percent of El Salvador's active work force is engaged in agriculture, although due to the seasonal basis of the work, most agricultural workers are actually underemployed, earning low wages and enjoying little, if any, job security.

Despite the continuing importance of agriculture to the nation's economy, El Salvador is also the most highly industrialized country in Central America and the percentage of its GNP stemming from manufacturing has been rising steadily in recent years. In 1968, the year prior to the outbreak of war between El Salvador and Honduras, the proportion of El Salvador's GNP attributed to manufacturing reached its highest point of 19.6 percent (4). The short war, in part a result of the country's rapid growth in population and the accompanying outflow of Salvadorans to neighboring countries, reduced sharply the volume of trade among the Central American states. This was a severe blow to El Salvador's economy, whose development has come to depend on the expansion of commercial ties within the region. Without an increase of trade within Central America, it is feared that the economic future of El Salvador and its neighbors will continue to be dependent on the price fluctuations of coffee and a few other agricultural exports.

The rate of job creation outside of agriculture accelerated during the last decade and in the capital of San Salvador alone, the number of positions in industry, construction, communication, and transportation rose from 62,000 to 83,000 during the 1962-1969 period (5). However, the increase did not keep pace with the rise in population. One projection estimates that if current demographic trends continue, El Salvador's population could surpass the 10 million mark by the year 2000, or about 1250 people per square mile. To a nation suffering deeply from unemployment, disease, and malnutrition, it has become clear that major social and economic changes must take place.

From the time El Salvador won her independence from Spain in the first quarter of the 19th century and established herself as an independent republic in 1841, the politics of the country have been dominated by a small group of wealthy land owners, by the army, or by a coalition of the two. Military men have controlled the political scene since 1931, and nine of the last 10 presidents of El Salvador have been army officers. With the military in command, the political situation has remained relatively stable. Nevertheless, the pressures created by El Salvador's rapid population growth militate against political conservatism and El Salvador's current generation of elected military leaders have moved gradually toward more liberal social policies and reforms. In recent years, the greatest emphasis has been placed on the development of the country's human resources and the reform of her educational system.

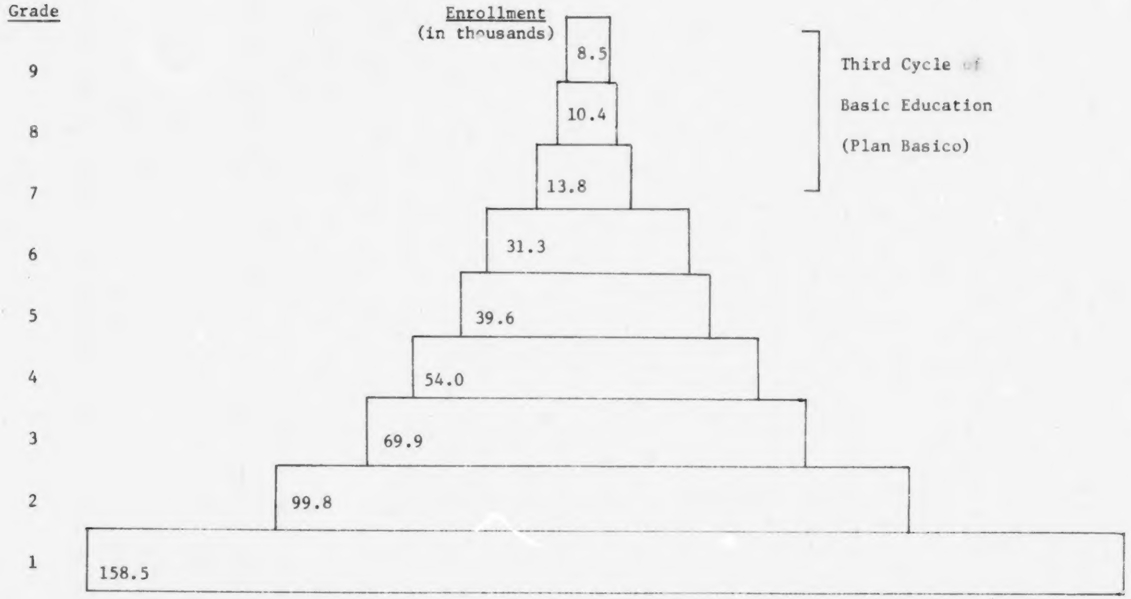
Origins of the Educational Reform

Education emerged as an important government priority during the last half of the 1960's when Salvadoran leaders decided that only through a comprehensive upgrading of the school system and the provision of new kinds of training opportunities could the nation resolve her pressing economic and social problems and, at the same time, carve out a place for herself in world trade. Israel and Japan, two other relatively small nations that have built strong economies in spite of scant natural resources, were frequently cited by Salvadorans as possible models for their own development. Leaving aside the experiences of these countries and their appropriateness to El Salvador, it was clear to the Salvadoran leaders that education was a prerequisite to economic growth and that it should therefore be a cornerstone of the country's development policy.

The impetus to educational reform in El Salvador began with the election campaign and subsequent inauguration of General Fidel Sanchez Hernandez as president in 1967. One of President Sanchez Hernandez' first appointments was Lic. Walter Beneke, a prominent ambassador and businessman, as Minister of Education. Under Beneke's direction, a commission was established to evaluate El Salvador's educational system and to propose reform measures.

Although Salvadoran law required that all children attend primary school, in the years preceding the Educational Reform fewer than one child in seven who began school ever graduated from the 6th grade. The El Salvador educational pyramid was a steep one in 1967 and, as Figure I-1 illustrates, over 50 percent of the students enrolled in grades one through nine were actually concentrated in first and second grade. The high dropout and repeater rates which produced this imbalance stemmed from a lack of opportunity in rural areas and a highly punitive grading and promotion policy. According to the Reform Commission's survey,

FIGURE I-1. Educational Pyramid in El Salvador, 1967



Source: Estimados de la Matricula Diurna en Educacion Primaria y Secundaria 1968-1975 y las Necesidades de Aulas y Profesores de Educacion Primaria, 1968-1975. CONOPLAN, San Salvador, April, 1968.

two-thirds of all rural schools did not offer all six primary grades and 60 percent of rural schools consisted of only one room and one teacher.

A second factor contributing to the high attrition rate among students was the inappropriateness of the primary and secondary school curricula which were based on the humanistic values of European education in the 19th century. The curriculum provided little practical guidance to teachers and they were overloaded with information at every grade level, prompting Minister Beneke to remark that they were designed to produce "human archives" -- students who were forced to memorize facts and concepts having little practical relationship to the needs of the country or to the problems the students themselves would have to face in their lifetimes. Finally, there was very little coordination between the curricula and real life employment opportunities. Since the curricula were tailored to the needs of an elite minority of students destined for the university, students who terminated their education at lower levels were not prepared to assume any productive role in their society. Even students who had completed a basic secondary education were equipped only to pursue higher academic credentials. The narrow focus of the secondary school curriculum constituted in the Reform Commission's view a rigid "bottleneck" to El Salvador's development and, specifically, to the need to train middle-level technicians and managers who could work effectively in the industrial sector.

Compounding the enrollment pressures and the high dropout and repeater rates, the Ministry of Education was also burdened with an administrative apparatus that could not deal adequately with existing problems, much less anticipate new ones. Symptomatic of the Ministry's organizational problems was the fact that her 22 departments were scattered in 20 different buildings in the capital of San Salvador. The resulting inefficiency and lack of coordination was illustrated by the situation that had developed in teacher training. There had developed a serious imbalance in the preparation of teachers and available job opportunities. The primary normal schools were producing graduates far in excess of the system's ability to absorb them. In 1967, it was estimated that over 2,000 primary school teachers were unemployed, yet the normal schools were continuing to expand. At the same time, unqualified teachers were teaching at the secondary level. According to Ministry estimates, four out of five teachers working at the secondary level (grades 7-9) had not completed the advanced studies required to instruct at that level. Such imbalances in the training and assignment of teachers resulted because there was insufficient communication and planning between the administrators of primary and secondary education and the officials responsible for coordinating teacher training programs.

The payment and supervision of classroom teachers was another serious administrative problem, particularly at the secondary level. Secondary teachers were paid on an hourly basis and many increased their incomes by teaching at a number of different schools every day. This practice necessitated dashing back and forth between schools and out of this pattern was coined the term "taxi teacher." Unfortunately, "taxi teachers" customarily had little time to spend with their students outside of class and this situation was not adequately controlled by the school supervisors.

Supervisors played a largely administrative role in El Salvador's school system prior to the Reform. With responsibility for an average of 42 schools, 80 teachers, and 6,800 students, the typical supervisor was burdened with a wide range of legal, political, and moral problems which he was not particularly qualified to handle and which prevented him from undertaking activities designed to improve the quality of classroom instruction. For these reasons, the Reform's planners wished to convert the school supervisor from a harried inspector to a more competent technical advisor and pedagogical consultant.

Elements of the Educational Reform

To remedy the numerous problems that had been inherited from previous administrations and to streamline an educational system whose goals and procedures had ceased to fit the needs of El Salvador, Minister Beneke set forth a comprehensive, five-year reform plan in 1968. The plan was systematic and thorough in its approach, touching virtually every aspect of the educational system. The major reforms included:

1. Reorganization of the Ministry of Education
2. Extensive teacher retraining
3. Curriculum revision
4. Development of new study materials
5. Modernization of the system of school supervision
6. Development of a wider diversity of technical training programs in grades 10-12

7. Extensive building of new schoolrooms
8. Elimination of tuition in grades 7, 8, and 9 (in 1971)
9. Use of double sessions and reduced hours to teach more pupils
10. A new student evaluation system incorporating changes in promotion and grading policies
11. Installation of a national instructional television system for grades 7-9.

Although some of these changes were enacted immediately, most were begun with the understanding that additional planning, experimentation, and adjustment would be required and that major changes could only be introduced on an incremental basis. However, the five-year reform timetable was a strict one; it coincided with the single term of President Fidel Sanchez Hernandez and Minister Beneke was anxious to prevent the President's mandate from being undermined or stalled through bureaucratic opposition or delays.

Early History of the ITV System

The decision to use television [illegible] a major component of El Salvador's Educational Reform was neither imposed from the outside nor taken in a precipitous fashion. As far back as [illegible] the possibility of introducing some form of educational television was being discussed, although there was no consensus and [illegible] knowledge about how television might help alleviate El Salvador's educational problems. Above all, the country lacked the [illegible] and expertise necessary to initiate any large television [illegible].

The initiative that led eventually to the establishment of El Salvador's national ITV system was taken by Lic. Beneke in 1961. During his ambassadorship to Japan, Beneke had been impressed by the role television played in that country's correspondence high schools. Anxious to stimulate the growth of something similar in his own country, Beneke sought the help of NHK (Nippon Hoso Kyokai, the Japan Broadcasting Corporation). NHK agreed to conduct a feasibility study in El Salvador and several engineers were dispatched for that purpose in 1962. The results of this study confirmed what Beneke had suspected; El Salvador possessed excellent topographical conditions for the installation of a national television network.

The initiative taken by Beneke was supported by former President Julio Adalberto Rivera, who established the first Educational Television Commission in the fall of 1963. The Commission was supposed to evaluate alternative uses for educational television with the goal of proposing a national plan. However, the Commission met sporadically and little progress was made until Beneke returned from Japan in 1965. Under Beneke's chairmanship, weekly meetings were instituted, and the Commission made a fresh start toward defining specific proposals for the use of television.

Throughout 1966 the Commission debated alternative ways in which television might best serve El Salvador's educational needs. How those needs were defined depended largely on the experience and particular interests of the Commission's individual members. A strong case was made for using television to extend the school to deliver basic education and literacy training to adults and young school dropouts who for a wide variety of circumstances had never completed the sixth grade. Other members of the Commission favored using television within the formal school system, although there was disagreement as to whether it would be more useful at the primary or secondary level.

By the end of 1966, the Commission had reached a consensus on a number of basic points. First, acknowledging the fact that their country had neither a reservoir of trained people nor sufficient economic resources to embark upon a large television project, the Commission decided that its initial efforts would have to be limited in scale, but flexible enough to permit expansion should circumstances permit. Second, the Plan Basico (grades 7-9) was selected to be the first level served by television, for it was the lack of opportunity and low quality of instruction at this level that was believed to constitute the "bottleneck" to El Salvador's development. Instructional television, the Commission members believed, would compensate for the many unqualified secondary school teachers who, in turn, could be trained in a short time to become effective monitors within television classes. Third, the Commission concluded that ITV should be administered by an autonomous institute directly under the President with freedom to set its own personnel policies and to import the vast array of technical equipment that would be required. Finally, the Commission resolved to seek foreign financial and technical assistance so that ITV could be put on as firm a footing as possible from the outset.

The World Bank displayed some interest in El Salvador's plans during this period and a feasibility study was conducted on its behalf in 1967. The study reached the same favorable conclusions as the earlier Japanese study, and members of the ETV Commission were optimistic that a World Bank loan could be obtained to launch an ITV system.

The ETV Commission's plan to seek World Bank assistance changed abruptly, however, when Colonel Fidel Sanchez Hernandez was elected President of El Salvador in March of 1967 and immediately thereafter attended a conference of hemisphere presidents at Punta del Este, Uruguay. There he heard President Lyndon Johnson set forth the U.S. proposal to sponsor a pilot instructional television program in Central America (6). Concurrent developments in his own country made Sanchez Hernandez realize that El Salvador would be a prime candidate for such a project and, upon his return, he vigorously backed the ETV Commission's efforts to put its case before the appropriate USAID officials.

USAID, which independently had come to consider El Salvador the prime candidate for the implementation of President Johnson's proposal, displayed an immediate interest in the Salvadoran request and in the spring of 1967 a team of American experts, under contract to the National Association of Educational Broadcasters, arrived in El Salvador to conduct another feasibility study. The six-man team not only confirmed the technical feasibility of ITV in El Salvador, but it also found many other circumstances that favored the establishment of such a system including the geography and size of the country, strong support for the project within the Ministry of Education, and indications that the Salvadoran Government intended to undertake a limited television project with its own resources (7).

The NAEB/USAID team ultimately recommended that USAID respond favorably to the Salvadoran request for financial and technical assistance. However, substantial differences were expressed during USAID's discussions with Salvadoran leaders concerning what kind of project should be undertaken. Reflecting the priorities of President Johnson's ETV Task Force, the U.S. representatives encouraged the Salvadorans to give televised instruction as full a test as possible and one that, if successful, could become a genuine showcase for the rest of the hemisphere. In accord with this view, the USAID team believed that television would have the greatest impact at the primary level where six out of seven Salvadoran students were enrolled.

The Salvadorans felt that a project at the primary level would be difficult, given the costs of such a system and their country's lack of experience with ITV. They also put forward an articulate case for instituting televised instruction at the Plan Basico level where their own analyses had revealed the greatest need. The Salvadorans' commitment on this point and their supporting arguments eventually convinced the USAID representatives and agreement was reached to begin a project at the Plan Basico level with the provision that, if the project succeeded, expansion into other areas would follow.

Also at issue during the early stages of the ITV project was the best place to rest over-all responsibility for the new system. The Salvadorans, wary of bureaucratic obstacles within their own Ministry of

Education, favored the establishment of a semiautonomous institute which would be responsible to the president of the republic. In this manner, they felt, it would be possible to avoid red tape in the procurement of equipment and the hiring of personnel. The USAID representatives, on the other hand, were fearful of granting the ITV project too much administrative autonomy. They believed that while freedom in the areas of equipment purchases and personnel recruitment would be desirable, close collaboration with the Ministry of Education was absolutely essential if ITV was to be integrated into the school system. For this reason, they argued that ITV should be developed within the Ministry of Education where planning could be carried out in conjunction with the Ministry officials who had jurisdiction over Salvadoran schools.

The debate over where to place the responsibility for the ITV project was not settled on the merits of the arguments outlined above, but rather by the fortuitous naming of Walter Beneke as Minister of Education in 1967. With Beneke as Minister, ITV was guaranteed strong political support at the highest level.

Despite the fact that development of an ITV system received a high priority within El Salvador's Educational Reform, school broadcasting did not begin until February, 1969, 18 months after Beneke had taken office. Such a delay was necessary for various reasons: to secure adequate financial support for the construction of a production studio, to recruit and train personnel to work in the ITV section, and to delineate ITV's role and responsibilities vis-à-vis those of the older, established divisions of the Ministry of Education.

Production Facilities

Of prime importance to the Salvadoran government and their USAID advisors was the construction of a production center to serve the new ITV system. Accordingly, under the terms of a project agreement, USAID agreed to donate the equipment for a complete production facility that would be constructed on the campus of the San Andres normal school. USAID also agreed to supply transmission equipment and 100 television receivers. All told, USAID's contribution to the start-up costs of El Salvador's ITV system amounted to $653,000. The Salvadoran government, in turn, provided a suitable building to serve as a production center as well as the system's operating budget.

The USAID grant was made on the understanding that during the first year of school broadcasting (1969) a second studio would be constructed and equipped. This addition would be financed by a $1.9 million loan from USAID which would include funds for the purchase of enough additional receivers to extend ITV's coverage to all seventh, eighth, and ninth grades. Also included in the loan were funds earmarked for the addition of transmission facilities. With two channels, the government believed it could eventually provide educational as well as other services to all parts of the country.

Recruitment and Training of the ITV Staff

At first, only employees of the Ministry of Education were considered for positions in the ITV division. This meant that the vast majority of teleteachers, directors, and technicians were drawn from the nation's teacher corps. Such a prerequisite had a clear rationale: the new division could be assembled without straining the Ministry's budget by creating all new positions and, as former teachers, the new ITV staff would presumably have a firsthand knowledge of the conditions and needs of the Salvadoran schools. There was also a large number of classroom teachers who had expressed an early interest in ITV and the project's leaders had no trouble attracting many candidates for the new jobs.

Finding qualified people to fill studio crew positions of the ITV system proved to be a more difficult problem. Such jobs do not necessarily require a great deal of formal academic training, but rather practical experience and know-how. Primary school teachers were relied upon to fill positions such as cameraman and switcher, but they were given only minimal training before being put to work.

Program Production

In the first year of broadcasting (1969), each of the ITV production teams was responsible for one seventh grade series -- math, social studies, etc. The teams were composed of five persons: two subject specialists, a television teacher, a producer-director, and a production assistant or "coordinator." With few exceptions, these positions were all filled by former classroom teachers.

The ITV subject matter specialists were responsible for the content of each broadcast. They worked from the official curriculum to prepare an outline of the learning objectives to be achieved in a particular television course as well as the specific concepts to be covered in each lesson. They were also responsible for preparing the accompanying classroom teacher's guide and student workbooks. The teleteacher was responsible for preparing his own script and, of course, for presenting it on the air. The producer-director was in charge of the shooting script and for all that happened in the studio -- the television performance, studio sets, camera angles, duration of scenes, etc. The production coordinator was responsible for assembling the visual materials that went into the program -- charts, models, slides, film clips, and guests who were introduced from time to time.

Lest this description give the impression of a highly fragmented production scheme, it should be noted that the teams themselves discovered in the first year of broadcasting that the secret to successful programming lay in a high degree of common planning and preparation for each telelesson. Through experience, the teleteachers and the subject area specialists found they had to work closely together if the telelessons, guides, and workbooks were to complement one another.

Originally, each production team was responsible for three or four twenty minute programs per week. Each broadcast was to be preceded by ten minutes of motivation and followed by twenty minutes of reinforcement by the classroom teacher. The number of programs was gradually reduced to two or three a week, as Table I-1 illustrates. Such a cutback reflected in part the need to crowd production for three grades into a single studio, in part a need to use air time as economically as possible, and in part a rethinking of the optimum number of programs that could be utilized effectively in the schools.

TABLE I-1

TV Classes per Week per Subject

	1969* Grade 7	1970 Grades 7 and 8	1971 Grades 7, 8 and 9**	1972 Grades 7, 8 and 9
Spanish	4 (3)	2	2	2
Social Studies	4 (3)	3	2 (3)***	2 (3)
Science	4 (3)	3	3	3
Mathematics	4 (3)	3	3	3
English	3	3	3	3

* After June 1969, ITV programming was reduced to 3 classes per subject.

** In the ninth grade in 1971 there were no ITV programs after July.

*** Eighth and ninth grades received only two social studies classes per week via ITV in 1971 and 1972, while the seventh grade received three.

ITV's Relationship to Other Educational Reforms

The ITV system, thrust into the forefront of El Salvador's Educational Reform, exerted considerable influence over the content of the other reforms and, particularly, their rate of development. By the time other elements of the Reform began to take shape in 1968, the Division of Educational Television had been operating in the Ministry of Education for two years and had already produced experimental programs at one of San Salvador's commercial television stations. Because leaders of the Reform insisted that televised instruction not be started ahead of concomitant reforms such as curriculum revision and teacher retraining, pressures grew on other divisions of the Ministry to keep pace with television's timetable.

The Salvadorans realized that if television were to be relied upon to upgrade the quality of instruction at the junior high level, the broadcast lessons would have to reflect a reformed curriculum. In Minister Beneke's words: "The present curriculum is archaic and is not responsive to the real needs of life. Since television is only an instrument for implementing curriculum, the quality of the whole educational system depends on the quality of the curriculum. The effective establishment of instructional television requires at the very least the elaboration of new and better curricula (8)." Thus, from the outset of the Reform, the revision of the curriculum for grades seven through nine was tied closely to television.

With televised instruction and a revised curriculum destined for all of El Salvador's junior high schools, the Ministry's planners further decided that classroom teachers would have to make fundamental changes in their traditional teaching styles. To ease the transition, a year's retraining course was developed and the system of school supervision was redirected away from the narrow task of inspection toward a more open and positive approach emphasizing classroom observation and counseling. Finally, the new curricula and the new teaching methods suggested the need for improved classroom materials for both teachers and students. These classroom materials were initially developed and distributed by the ITV Division.

ITV was unquestionably the most visible and highly publicized of El Salvador's educational reforms. Throughout the 1960's, articles appeared in the nation's press documenting the early interest in ITV and subsequently recording the government's efforts to construct a new studio and install television sets in Salvadoran schools. The inauguration of the San Andres studio by Presidents Fidel Sanchez Hernandez and Lyndon Johnson in July, 1968, was the high point of such coverage for it focused public attention on the ITV project. The publicity given ITV overshadowed the fact that other significant changes were occurring in El Salvador's educational system. In 1970, when a sample of parents were asked to recall what they knew about the Educational Reform, most could only remember television.

Finally, ITV was the component of the Reform that demanded the most foreign technical assistance. Among the numerous foreign advisers who worked alongside Salvadoran counterparts in the Reform projects, more than three-quarters had at least some association with the ITV system.

Such a concentration of resources sustained the momentum of the project and maintained ITV's preeminent position.

In sum, ITV provided an impetus to change in El Salvador as well as a sufficient justification for numerous system-wide changes that would probably not have been as readily understood or accepted in the absence of television. El Salvador's experience suggests that to be an effective instrument of change, major educational innovations such as television cannot simply be appended to traditional structures; rather, they must be accompanied by multiple changes in other areas of the educational system. As the Reform progressed, most Salvadoran leaders expressed the view that the Educational Reform could not have been implemented without the catalytic effect of television. They argued that while many of the reforms instituted in the 1968-1972 period were long overdue and would most likely have been implemented by any new minister, the ITV system provided the vital spark and necessary impetus to change.

Footnotes

1. Republica de El Salvador. Consejo Nacional de Planificacion y Coordinacion Economica (CONOPLAN). Indicadores Economicos y Sociales. San Salvador: 1970.

2. Inter-American Development Bank. Social Progress Trust Fund, Ninth Annual Report, Washington: 1969.

3. Republica de El Salvador. Ministerio de Economia. Direccion General de Estadistica y Censos. Anuario Estadistico, 1968. San Salvador: 1968.

4. Republica de El Salvador. Ministerio de Economia. Direccion General de Estadistica y Censos. Anuario Estadistico, 1968. San Salvador, 1968.

5. Speagle, Richard E. Educational Reform and Instructional Television in El Salvador: Costs Benefits, and Payoffs. Academy for Educational Development. Washington, D. C. 1971, p. 24.

6. President Johnson's proposal for a Central American pilot project in educational television stemmed from a recommendation of his White House Task Force on ETV in the Less Developed Countries which had been established in November, 1966, under the chairmanship of the Hon. Leonard Marks.

7. National Association of Educational Broadcasters. "The Feasibility of Using Television for Educational Development in El Salvador," Washington: 1967.

8. Republica de El Salvador. Plan Quinquenal 1968-1972, Sector Educacion (DT No. 659), Consejo Nacional de Planificacion y Coordinacion Economica (CONOPLAN), San Salvador: 1968.

Chapter II

Student Learning

A primary goal of El Salvador's Educational Reform was to improve student learning. Lic. Walter Beneke, Minister of Education and prime mover of the Reform, spoke disparagingly of the "human archives" that he believed the traditional educational system had produced. The new, reformed system was to change that; graduates would be critical thinkers capable of scientific inquiry, able to deal with abstraction in a more sophisticated way. They would be able to function in industrial jobs that would be attracted to El Salvador by the existence of a large, well-trained labor pool. Furthermore, the new system would expand opportunity as well as improve quality. Previously, only 15-20 percent of first grade entrants actually graduated from primary school. Under the Reform, a much larger percentage of the age-eligible population was expected to finish nine grades of basic education.

The evaluation of the qualitative aspects of El Salvador's Educational Reform was two-fold. Because the most influential cognitive effects of schooling are not the specific content learned in the classroom but rather verbal and numerical skills and general reasoning capacity, student development in these skill areas was measured with General Ability and Reading Tests. If the Educational Reform and its television component were to make an important qualitative difference, improvement would have to be reflected on these tests. The primary criterion for the effectiveness of ITV and the Educational Reform was, therefore, the rate of increase on General Ability and Reading tests.

A second indicator of learning quality was provided by achievement tests geared to the curriculum of each course. These tests made it possible to evaluate the success of the televised series in teaching specific content. It was also logical to expect that such short term success in course achievement would precede significant gains in the more basic cognitive skills mentioned above.

Learning of Basic Skills

Analysis of the General Ability and Reading tests (1) showed striking results. There were large gains in total scores on both tests for all three student cohorts (2). In addition, the rate of gain on General Ability was greater for the Reform with ITV classrooms than for the traditional classroooms or the Reform classrooms not using ITV. Within each grade, younger students outperformed older students and boys outperformed girls on both General Ability and Reading Tests. Table II-1 displays the General Ability and Reading means by cohort as they changed during each group's school career. Each cohort made significant gains on both tests during Third Cycle. Three factors seem to explain these changes.

It is reasonable to assume that improvement in test-taking ability within each student cohort occurred. The great majority of students had no previous experience with multiple choice aptitude tests, and the

TABLE II-1

General Ability and Reading Scores over time, for each Cohort

	Cohort A (N=902)	Cohort B (N=700)	Cohort C (N=600)
General Ability Beginning 7th	89.6*(60)	58.9	53.4
General Ability Beginning 8th	76.7	71.2	
General Ability End 8th			66.0
General Ability Beginning 9th	83.6		
General Ability End 9th	89.0	81.2	
Reading Beginning 7th	65.1*(40)	37.9	33.6
Reading Beginning 8th	49.2	46.9	
Reading End 8th			44.4
Reading Beginning 9th	54.4		
Reading End 9th		55.4	

* As explained in footnote 1, these tests were level 3 versions of the Inter-American series. All other administrations used the more difficult level 4 test. Interpolating from table 71, pg. 60 of the Technical Report prepared by Guidance Testing Associates to document validation of The Interamerican Series, a 90 level 3 score is approximately equivalent to a level 4 score of 60. A level 3 reading score of 65 is approximately equivalent to a level 4 reading score of 40.

importance of such test-taking experience is well known. For example, Educational Testing Service offers practice versions of some of its tests so that examinees can familiarize themselves with the test format. Thus, for the test-naive Salvadoran children, some of the gains that were achieved between the first two administrations may have reflected increased test-taking wisdom. While no precise estimate of such wisdom is possible, the larger increases between the first two administrations of each test than between subsequent administrations may partly reflect its influence.

The second factor influencing gain was maturation or spontaneous growth. If a student's capacity for intellectual growth increases until the age of fifteen or thereabouts, some gain on general abilities, particularly in non-verbal reasoning skills, is expected to occur with or without school. Also, out of school learning opportunities (mass media exposure, visits to the city, or simply coping with one's environment) may influence growth in these abilities. However, since the research design did not include a control sample of students who left school after sixth grade, it was not possible to separate the effects of simply being three years older from the effects of having attended school for three years.

Finally, change in General Ability and Reading were clearly related to schooling. While it could not be proved that school attendance causes students to gain a certain amount on cognitive tests, the next section shows that different kinds of schooling (traditional, Reform with ITV, Reform without ITV) were related to varying rates of change on

General Ability. Clearly, if differences in schooling had an effect, then schooling itself did. In addition to these main effects on change in basic skills, there were noteworthy influences of age and sex and (possibly) socio-economic background in interaction with schooling and/or maturation.

As noted above, change in basic skills scores was the emphasis of the analysis. However, the reader should not misunderstand this emphasis and assume that vast transformations occurred in the students' general abilities. Over-all increases were large, but the rankings of students on basic skills tests were quite similar at the beginning and the end of their Third Cycle careers. Thus, most of the variance in General Ability scores at the end of ninth grade could be predicted from students scores at the beginning of seventh grade (Table II-2). In fact, from 55-78 percent of the variance in final General Ability and Reading scores could be predicted from the student's performance on similar tests administered at the beginning of seventh grade.

What does this mean? Basically, it means that the skills that Salvadoran students brought to seventh grade determined the skills that they graduated with at the end of the ninth grade. Exceptions will be noted below, but the over-all improvement was not one that greatly changed the pecking order. This was not a surprising finding. To the extent that these scores represent underlying intelligence, and that intelligence is relatively stable, little change should have been expected. At best, the Reform's architects might have hoped that schooling would accelerate over-all growth in basic skills, and perhaps

TABLE II-2

General Ability and Reading Intracorrelations

	Correlation*	Variance Accounted for	Remaining iance Pos to Predic
Cohort A			
Gen. Abil. 7th Beg. x Gen. Abil. 9th End	.743	55%	45
Reading 7th Beg. x Reading 9th Beg.	.870	76%	24
Cohort B			
Gen. Abil. 7th Beg. x Gen. Abil. 9th End	.885	78%	22
Reading 7th Beg. x Gen. Abil. 9th End	.776	60%	40
Cohort C			
Gen. Abil. 7th Beg. x Gen. Abil. 8th End	.813	66%	34
Reading 7th Beg. x Gen. Abil. 8th End	.802	64%	36

*Corrected for Unreliability - see Footnote 5 redress some of the inequalities related to social background and opportunity that the students brought to seventh grade.

Effects of the Reform and ITV

Students in ITV classrooms gained more in General Ability than did students in traditional classrooms (Cohort A) or students in Reform classrooms without ITV (Cohorts B and C). On reading exams, there were no significant differences between any of the comparison groups.

Table II-3 displays the means over time for each schooling subgroup of each cohort on each test. A mean change score has been calculated for each subsample of each cohort by subtracting each group's mean on the first administration of the General Ability test from its mean on the last administration of the same test. These change means are recorded in Table II-4, where significance figures are reported. All of these comparisons exclude students from San Salvador because the capital city had only one traditional classroom and no Reform classrooms without ITV.

In Cohorts B and C, the ITV classrooms began seventh grade with higher means on General Ability and Reading tests. In order to control for that original difference, the influence of various demographic and background variables (sex, age, wealth, father's education, mother's education and urbanization) on the change scores were estimated. That influence was subtracted from the raw change scores, yielding residual difference scores. The residual change scores on General Ability, free

ITV and Non ITV Scores in General Ability and Reading

		Cohort A*		Cohort B		Cohort C	
		(N=419) '69 Enterers	(N=156) '69 Enterers	(N=298) '70 Enterers	(N=87) '70 Enterers	(N=343) '71 Enterers	(N=130) '71 Enterers
Test	Time of Administration	ITV + Reform	Tradi-tional	ITV + Reform	Reform No ITV	ITV + Reform	Reform No ITV
Gen. Abil.	Beg. 7th	86.99	88.56	57.93	54.60	51.62	49.70
Gen. Abil.	Beg. 8th	74.61	74.32	70.70	62.70		
Gen. Abil.	End 8th					65.23	59.95
Gen. Abil.	End 9th	87.80	86.31	82.56	73.66		
Gen. Abil. Gain 7th to 8th						13.61	10.25
Gen. Abil. Gain 7th to 9th		.811	-2.25	24.62	19.06		
		(N=468)	(N=160)				
Reading	Beg. 7th	63.32	64.79	37.96	33.00	32.25	30.01
Reading	Beg. 8th	48.03	48.45	46.67	40.81		
Reading	End 8th					42.93	41.70
Reading	Beg. 9th	51.76	55.60				
Reading	End 9th			56.04	50.57		
Read. Gain Beg. 7th to End 8th						10.676	11.692
Read. Gain Beg. 7th to Beg. 9th		-11.56	-9.19				
Read. Gain Beg. 7th to End 9th				18.085	17.565		

*As explained in footnote (1), the small or negative gains reproted for Cohort A reflect the change from an easier test in 7th grade to a more difficult one in 9th.

from the influence of background factors, were only slightly altered, and they were still significantly in favor of the ITV classrooms (Table II-4). None of the reading differences were significant when either raw scores or residual scores were used.

Such a post hoc control procedure is never completely satisfying. One can never be sure whether all of the causes of the original differences on the tests have really been controlled, whether the different rates of change are due to different instruction, or to undetected causes of the original differences. However, from the Salvadoran data, one can be fairly confident about the instructional method hypothesis. The fact that the result was replicated in three student cohorts, including one (Cohort A) in which the original advantage belonged to the traditional classrooms, was powerful evidence.

For a decision maker, however, significant differences in test results do not necessarily provide sufficient policy guidance. He must know not only the statistical significance of the results, but also their practical implications. How much gain over and above that achieved by non-ITV classes can he buy for how much of an additional investment? The Salvadoran investment is treated in Chapter Seven and in Table II-5 an attempt is made to quantify the advantage in learning gain. Percentage gains and the percentage advantage in gain of ITV over non-ITV subsamples are reported. The ITV percentage advantage in gain varies from 15 percent (Cohort A) to 28 percent (Cohort C). However, it should be noted that these estimates were subject to large error factors, perhaps as much as 10-12 percent, plus or minus, at the 95 percent confidence level.

TABLE II-4

General Ability and Reading Change Scores by Instructional Condition (excluding schools in San Salvador)

	General Ability Gain		General Ability Residual Gain	
	ITV	No ITV	ITV	No ITV
Cohort A	.811*	-2.250*	.947*	-2.588*
Cohort B	24.623**	19.055**	24.361**	19.985**
Cohort C	13.606*	10.254*	13.522*	10.405*

	Reading Gain		Reading Residual Gain	
	ITV	No ITV	ITV	No ITV
Cohort A	-11.556	-9.188	-11.4335	-9.563
Cohort B	18.085	17.565	17.969	17.967
Cohort C	10.676	11.692	10.711	11.625

*difference between ITV and No ITV significant at $p<.05$

**difference between ITV and No ITV significant at $p<.01$

TABLE II-5

Percentage Gain on General Ability of ITV vs. No ITV

	Cohort A[*]		Cohort B		Cohort C[**]	
	ITV	Trad.	ITV	Reform (No ITV)	ITV	Reform (No ITV)
% Gain in General Ability	54.2%	47.3%	42.5%	34.9%	26.4%	20.6%
ITV Advantage[***] over No ITV Gain	14.6%		21.8%		28.2%[*]	

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[*] To have a useful scale we have replaced The Cohort A level 3 exam score from the beginning of 7th grade with level 4 equivalents from Table 71, pg. 60 of the Test Manual (level 3, 86.99= level 4, 57.0; level 3, 88.56= level 4, 58.6).

[**] These figures represent the gain over two years.

[***] The formula for this: $\frac{\%\text{ ITV gain} - \%\text{ No ITV gain}}{\%\text{ No ITV gain}}$

Interaction of Change in Basic Skills with Background Variables

With evidence in hand supporting the basic hypothesis that students in ITV classes improved more rapidly than their peers without ITV, we can move to the next stage in the analysis. To what extent did ITV equalize opportunity to learn? We knew that boys, urban students, younger children in a grade, children with better educated parents, and children from wealthier families scored higher than less advantaged peers on General Ability and Reading tests when they arrived in seventh grade. Table II-6 supplies the relevant correlations (3) of sex, age, father's education, mother's education, wealth (as measured by TV ownership), and urbanization with General Ability and Reading test scores.

Given this start, what happened? Did those who began with a head start increase their initial advantage? Did girls and rural children, and children of parents lacking formal education and poorer children, fall farther and farther behind or did these disadvantaged groups gain more rapidly, thereby closing the gap in basic skills that existed when they began seventh grade? Was such gap-opening or gap-closing affected by differences in schooling? Was there evidence that presence in an ITV class accelerated gap-opening or gap-closing beyond that which occurred in traditional classrooms, or in Reform classrooms without ITV?

These questions were dealt with in two stages. First, the influence of the background variables on change in General Ability and Reading scores were examined for each student cohort. Then, taking

TABLE II-6

Correlations[*]: Basic Skills by Background Variables

	General Ability (Beginning 7th)			Reading (Beginning 7th)		
	Cohort A	Cohort B	Cohort C	Cohort A	Cohort B	Cohort C
Sex: (Female=0 Male=1)	.140	.124	.151	.209	.151	.131
Age	-.274	-.376	-.319	-.223	-.324	-.280
Father's ed.	.157	.321	.227	.141	.333	.255
Mother's ed.	.145	.298	.209	.107	.299	.235
Wealth	.171	.283	.203	.127	.464	.253
Urbanization (rural=1, urban=5)	.232	.301	.331	.226	.252	.378

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[*] All correlations are significant at $p < .001$. For Cohorts A and B disattenuated (corrected for unreliability) coefficients are reported. The relevant measurement models are fully explained in Footnote 5 to the chapter.

the full sample analysis as a base, ITV and non-ITV subsamples within each cohort were compared to see whether the pattern of influence differed.

For all these analyses, linear regression was applied (4). Each final test score was divided into two components, that information which was predictable from the test score at the beginning of Third Cycle, and that information which could not be predicted from that score. The latter component might best be called an independent change score because it was free of the influence of the original test score. For Cohorts A and B it was also possible to specify the error component or unreliable variance of the final test score (5). The influence of each of the six background variables on both the original test scores and the independent change scores could then be estimated.

For the full sample, one equation was estimated for each cohort to predict separately original General Ability, independent change in General Ability, original Reading Skill, and independent change in Reading Skill. Thus, there were three replicating equations for each of four dependent variables. The standardized regression coefficients for all twelve equations are reported in Table II-7. Since it was possible to specify the error variance in all scores for Cohorts A and B, the coefficients reported for those cohorts reflect a correction for unreliability. For Cohort C, coefficients are based on calculations with the raw scores.

TABLE II-7

Regression Coefficients for Cohorts A, B and C: Predicting Gains in Basic Skills from Background Variables

	Sex			Age			Father's Ed.			Mother's Ed.			Wealth			Urbanization		
Full Samples:	Cohort A	Cohort B	Cohort C	Cohort A	Cohort B	Cohort C	Cohort A	Cohort B	Cohort C	Cohort A	Cohort B	Cohort C	Cohort A	Cohort B	Cohort C	Cohort A	Cohort B	Cohort C
Gen. Abil. 7th	.13**	.14	.15	-.49	-.24	-.22	-.12	.11	.05	.03	.10	.05	-.08	.09	.01	.48	.18	.24
Gen. Abil. Independent Change* Score 7th-9th	.15	.12	.17	-.67	-.24	-.18	-.24	-.04	.04	-.02	-.11	-.02	-.17	-.07	-.07	.56	.03	.06
Reading 7th	.20	.16	.14	-.44	-.15	-.16	-.09	.10	.06	-.01	.07	.04	-.10	.34	.06	.45	.09	.29
Reading Independent Change Score 7th-9th	.03	.19	.02	-.39	-.21	-.19	-.03	-.07	-.03	-.03	.01	.05	-.07	-.19	-.03	.28	.05	.03

*An independent change score, as described in the text, is that part of the final test score which was neither error nor predictable from the beginning of 7th grade test score.

**This table entry would be read as follows; in the regression equation predicting 7th grade General Ability of Cohort A from the background variables, the standardized regression coefficient for Sex is .13

Factors Influencing Basic Skills at the Beginning of Seventh Grade

Original scores on both tests for all three cohorts were consistently related to three variables: sex, urbanization, and age. The fact that boys consistently outscored girls appeared to be unrelated to any of the other previously named socioeconomic variables. If anything, girls came from slightly higher socioeconomic strata than did boys. Two general explanations might be suggested. Girls might have been less intelligent. While no data specifically refuted this hypothesis, comparative data from the U.S. and other countries (Maccoby, E., 1966) indicate that girls generally achieve better than boys in primary school and only at higher academic levels is that trend reversed. Since that advantage is not ordinarily cited as evidence of superior female intelligence, it would not have been fair to make the opposite assumption in the Salvadoran case.

More persuasively, the expectations of the Salvadoran culture (and the self-expectations they produce) may have accounted for the sex differences in achievement. Children with lower self-expectations would tend to be less motivated to achieve. While this hypothesis was not investigated directly, some incidental evidence corroborated it. In Chapter Four, girls' aspirations are shown to be sharply lower than boys'; the careers they sought (secretaries, nurses) required less education than the professional careers most often cited by boys. Also, the tendency for girls to come from higher socioeconomic strata suggested that a poor family was more likely to send a son than a daughter to school. In general, Salvadoran families believe that education is more essential for boys than for girls.

Rural children began with lower scores on the tests than their urban counterparts. This was no surprise. These children came from generally poorer homes and their parents were less well educated. One can reasonably guess that their primary schooling was also of lower quality, both in teaching quality and in access to materials. Teachers, when given a choice, prefer to remain in the city. It was likely, then, that the least experienced teachers, those with little seniority or right to choose location, would be assigned to the countryside. Also, the materials and facilities found in rural schools were poorer than those of urban schools. Ample evidence of this was obtained at the Third Cycle level, and it was probably true for the first six grades as well.

Finally, age was negatively related to seventh grade test scores: older children within a grade did worse. While superficially surprising, considering the positive effects of maturation, brief consideration of who those older children were made the negative relation understandable. The child who was old for his grade level had either 1) repeated a year of school, 2) entered school late, or 3) dropped out for a year or more during primary school. Each of these situations was more common among children from disadvantaged homes. The negative correlations of age with father's education, mother's education, wealth and urbanization were strong in each cohort.

Influences on Change in Basic Skills

Age and sex were the only variables whose influence on change in General Ability and Reading were generally consistent and of significant magnitude across all three student cohorts (Table II-7). Once again, boys gained more rapidly than girls, and younger children more rapidly than older children within a grade. The latter finding was particularly striking; at no time were the age/General Ability and age/Reading relations not significant, and for Cohort A age was an extremely strong predictor of change on both basic skills tests (although the coefficients may have been inflated because of some inadequacy of the measurement model).

What are the policy implications of these results? They are potentially immense, depending upon the interpretation one places upon the age/basic skills relations. Was it the fact of being older in a grade, of having repeated a grade, or of having entered late, which damaged the child's self-image and caused him to achieve poorly? Or were the reasons which caused a child to arrive in seventh grade older than his peers also those that explained his poor achievement? If a student was old for his grade, there were numerous possible reasons: he had been intellectually unprepared for primary school, he came from a poor family which needed his labor part of the year, he was sick, his family moved and he could not transfer schools easily, his teacher did not like him, there was no complete primary school in the town where he lived. Certainly other reasons could be suggested. Any of them, or a combination of them, could be put forward to explain the lower achievement among older students in a grade.

The data did not permit separation of the two hypotheses (e.g. age affects achievement, or personal history affects both age and achievement). However, an explanation attributing the effects of age entirely to prior socioeconomic causes was rejected since age was a more powerful predictor of change in skills than any of the socioeconomic indicators. However, it was not possible to eliminate some of the other causes, either in isolation or in interaction with the socioeconomic variables.

If either by assumption or after research directed to that problem, one were able to accept the notion that age (within a grade) negatively affected achievement, one could strongly recommend that every effort be made to pass students through the school system as rapidly as possible. In fact, with its new system of oriented promotion, El Salvador has begun to assure that students move through the system with far less probability of repeating than was true in the past.

One might also ask whether original basic skills themselves had any influence on subsequent change in basic skills. Since the measurement model defined the correlation between original score and change to be zero, it was not possible to test for the influence of that original score in the regression models. However, re-examination of Table II-1 produced the suspicion that such an influence existed.

Comparing the beginning of eighth grade scores for Cohorts A and B, Cohort A was found to have a higher mean. At least part of that advantage was probably already present when both cohorts entered seventh grade. Similarly, Cohort B began seventh grade with a higher mean General Ability score than did Cohort C. A comparison of parallel General Ability changes reveals that, in absolute terms, that Cohort A gained faster than Cohort B, and Cohort B gained faster than Cohort C. For example, between the beginning of eighth grade and the end of ninth, Cohort A increased 12.3 points. During the same period, Cohort B gained only 10 points.

Between the beginning of seventh and the beginning of eighth, Cohort B increased 12.3 points. However, between the beginning of seventh and the end of eighth, Cohort C increased only 12.6 points. One can scarcely doubt that Cohort B would have gained several more points in eighth grade. Thus, an inference that Cohort B gained more rapidly than Cohort C seems justified.

One clear result emerged from the above analyses: the cohort that started highest in General Ability gained more than the next highest starting cohort, which in turn gained more than the lowest starting cohort. Why this was true is less clear. It could have been because children who entered with higher General Ability scores took more advantage of their schooling. However, the result could also mean that each cohort received less satisfactory schooling than its predecessor. Cohort A included the 32 pioneer classes in the Reform. Unquestionably, they received special attention their first year, and to some extent afterwards. Cohort C, with the least gain, not only started with the lowest mean on basic skills, but also began seventh grade in the year of the great expansion, 1971. Classes were much larger, double sessions were common and teachers were forced to take on extra heavy loads. Any of these factors could have been sufficient cause for lower achievement.

Basic Skills Change: The Interaction of Background and Instruction

The significant difference in General Ability gains related to instructional method has already been noted, along with the strong relationship between rate of gain and the variables of age and sex which was found in all three cohorts. It is now appropriate to ask whether a particular instructional method mediated this influence of age, sex, or the other background variables on gains in General Ability and Reading.

To test for such an influence, the cohorts were divided into ITV and non-ITV subsamples and the regression equations used above for the whole sample were rerun. Then the influence of sex on General Ability change for ITV and non-ITV students, were compared. Since a positive coefficient for sex reflected gap-opening (boys increasing an already existing advantage over girls), the subsample with the larger coefficient was considered to reflect a greater tendency toward gap-opening. Tentatively, the instructional method from which the subsample had been drawn was said to magnify that tendency in relation to the other instructional method. If one instructional method subsample had a consistently larger coefficient for all three cohorts, one could say with some confidence that it had a gap-opening effect——or vice versa, that the effect showing the smaller coefficients had a mediating effect on the influence of the background variable in the direction of gap-closing.

As Table II-8 illustrates, in only one case, the relation between General Ability change and urbanization, was mediating influence found. For the ITV subsamples in all three cohorts, it appeared that the urban students had no advantage over the rural students; while for the non-ITV subsamples there was some relation, with the urban students gaining considerably more than the rural students.

As a partial qualification of the above inference, it must be noted that for the ITV subsamples of Cohorts B and C there was a larger original General Ability/urbanization coefficient than for the non-ITV subsamples. For those two cohorts, the greater gap-opening influence with the non-ITV subsamples meant that at the end of the ninth grade, both subsamples had more or less equal General Ability/urbanization coefficients. For Cohort A, the traditional subsample started with a larger General Ability/urbanization coefficient and increased that coefficient more than the ITV subsample did.

Thus, instructional method did not weaken the influence of any of the other background variables in a consistent way across the three cohorts. Nor was there any significant mediation advantage to either instructional method when all of the independent tests of gap-closing were combined.

Altogether, there were 18 tests (six background variables for each of the three cohorts) for mediation effects within General Ability and Reading gains. For gains in General Ability, there were nine cases when

TABLE II-8

Regression Coefficients by Instructional Condition (ITV vs. No ITV) for Cohorts A, B, and C: Predicting Gains in Basic Skills from Background Variables

	Sex			Age			Father's Ed.			Mother's Ed.			Wealth			Urbanization		
ITV Samples:	Cohort A	Cohort B	Cohort C	Cohort A	Cohort B	Cohort C	Cohort A	Cohort B	Cohort C	Cohort A	Cohort B	Cohort C	Cohort A	Cohort B	Cohort C	Cohort A	Cohort B	Cohort C
GA 1	.16	.11	.15	-.20	-.20	-.20	.00	.14	.08	.07	.08	.00	.06	.09	.03	.14	.22	.26
GA Gain	.12	.17	.17	-.26	-.27	-.15	-.14	.05	.08	-.04	-.20	-.03	-.06	-.03	-.07	-.07	-.06	.02
RD 1	-.24	.22	.14	-.18	-.16	-.11	.08	.15	.11	-.04	.07	.03	.01	.16	.09	.09	.23	.24
RD Gain	.05	.18	.01	-.21	-.27	-.24	.02	-.10	-.01	.03	.00	.05	.07	-.19	.01	.09	.09	.00
No ITV Samples:																		
GA 1	-.03	.22	.17	-.49	-.29	-.33	-.12	.05	-.06	.00	.13	.20	-.14	.08	-.05	.48	.04	.14
GA Gain	-.01	.06	.19	-.52	-.16	-.24	-.04	-.25	-.14	-.18	.12	.04	-.23	-.14	-.07	.21	.16	.12
RD 1	.17	.09	.13	-.22	-.12	-.30	-.26	.05	-.16	.18	.20	.14	-.05	.06	-.04	.25	.21	.39
RD Gain	-.07	.20	.02	-.50	-.12	-.09	.26	-.03	-.18	-.42	-.02	.06	-.16	-.07	-.15	.27	-.03	.11

the non-ITV subsample showed less gap-opening tendency, eight when the ITV subsample showed less gap-opening tendency and one case when the subsamples had identical coefficients. For the Reading gains, nine tests of the mediation hypothesis favored ITV and nine favored the non-ITV subsample. Over-all, then, neither instructional method appeared to lessen original disadvantages related to background, with the possible exception of those related to urbanization.

Course Specific Learning

During each year of the research, before and after achievement tests in mathematics, science, and social studies were administered. Tests used in 1969, 1970, and 1971 were written by the Educational Testing Service of Princeton, New Jersey, from El Salvador's official curricula. 1972 tests were prepared by evaluation personnel working in El Salvador from revised curricula. Each test was designed to cover the content which students were expected to learn during the school year in a specific course (6). Table II-9 details the test administration schedule.

Two questions were examined on the basis of the test result data: first, was the over-all learning of students satisfactory and second, did the ITV classes learn more than the classes without television?

TABLE II-9

Achievement Test Administration Schedules in Mathematics, Science and Social Studies for Cohorts A, B and C

	Cohort A	Cohort B	Cohort C
1969	3 Before & After 7th Grade Tests		
1970	3 Before & After 8th Grade Tests	3 Before & After 7th Grade Tests	
1971	3 Before & After 9th Grade Tests	3 Before & After 8th Grade Tests	3 Before & After 7th Grade Tests
1972		3 Before & After 9th Grade Tests	3 Before & After 8th Grade Tests

Was the Learning Satisfactory?

With only a single exception, there was significant learning gain in every course, in every grade, for every student cohort. Of a total of 24 mean gain scores (three subjects by three grades for Cohorts A and B, three subjects by two grades for Cohort C), 23 were significantly different from zero. However, given the large number of students in each cohort, significant gains included one as small as 4 percent of original score. Under such circumstances, there were obviously more important questions; namely, were the gains sufficient and can El Salvador's educators be satisfied with student performance?

No absolute criteria were ever set, either by the Salvadorans, by the test makers or by the evalutaion staff to evaluate the adequacy of learning in the classroom. Theoretically, a test designed to sample a curriculum should, if that curriculum was learned, be answered successfully. One would then expect a large number of students to reach some criterion level (perhaps 70 percent) on a final exam. On the other hand, it is clear that such an exam can be of arbitrary difficulty. Given a large and complex set of concepts, there are some which no teacher expects the majority of his students to master. If a large number of the test questions deal with the hardest concepts, the test will be difficult. Since the test construction procedure described in the footnotes had no satisfactory control on the difficulty of the questions, adopting a given score on the final test as a criterion of learning success could not be justified.

In addition, the tests were strongly related to General Ability. If general ability changes only slowly and that change determines achievement gain, one could not reasonably expect great changes on the achievement tests. Given that test scores were low to begin with, no leap to the magic 70 percent level could be expected. This inability to state the importance of gains on learning tests was among the reasons that led the research team to depend on the basic skills tests as the primary measures of learning.

Identical tests in math, science, and social studies were administered at the beginning and end of each school year. Percentage gains over beginning test scores were adopted as the basic measures of achievement because unlike absolute gains or final exam scores, they could be corrected for some differences that existed between cohort subsamples and subjects at the beginning of the year. Each reader can set his own criterion for learning sufficiency, although gains of less than 20 percent over the course of a full school year must be questioned. Tables II-10, II-11 and II-12 report before and after scores, gains and percentage gains for each grade for each cohort in math, science, and social studies. Figure II-1 is a histogram of the percentages of gain by test, grade, and cohort.

Of the 24 gain percentages, 11 were larger than 20 percent. Of these, nine were from the seventh grade. In fact, 7th grade gains in all subjects for each student cohort were greater than 20 percent. In eighth grade, only one out of nine gains reached 20 percent, while in ninth grade only one out of six gains reached that level. The small

TABLE II-10

Mathematics: Overall Means, Gains and Percentage Gains

	Cohort A (N=712)	Cohort B (N=505)	Cohort C (N=558)
7th Beginning	12.087	15.315	14.125
7th End	17.896	18.633	17.439
Gain	5.809	3.318	3.314
% Gained	48.1%	21.7%	23.5%
8th Beginning	15.995	13.658	16.631
8th End	17.949	16.179	19.443
Gain	1.954	2.521	2.812
% Gained	12%	18.5%	16.9%
9th Beginning	15.476	18.197	
9th End	18.021	22.929	
Gain	2.545	4.732	
% Gained	16.4%	26%	

TABLE II-11

Science: Overall Means, Gains and Percentage Gains

	Cohort A (N=705)	Cohort B (N=519)	Cohort C (N=573)
7th Beginning	18.368	20.784	19.402
7th End	23.921	25.493	23.452
Gain	5.553	4.709	4.05
% Gained	30.2%	22.7%	20.9%
8th Beginning	24.193	21.979	22.127
8th End	25.983	24.688	22.285
Gain	1.790	2.709	.158
% Gained	7.4%	12.3%	.7%
9th Beginning	20.538	25.364	
9th End	22.571	28.552	
Gain	2.033	3.188	
% Gained	9.9%	12.6%	

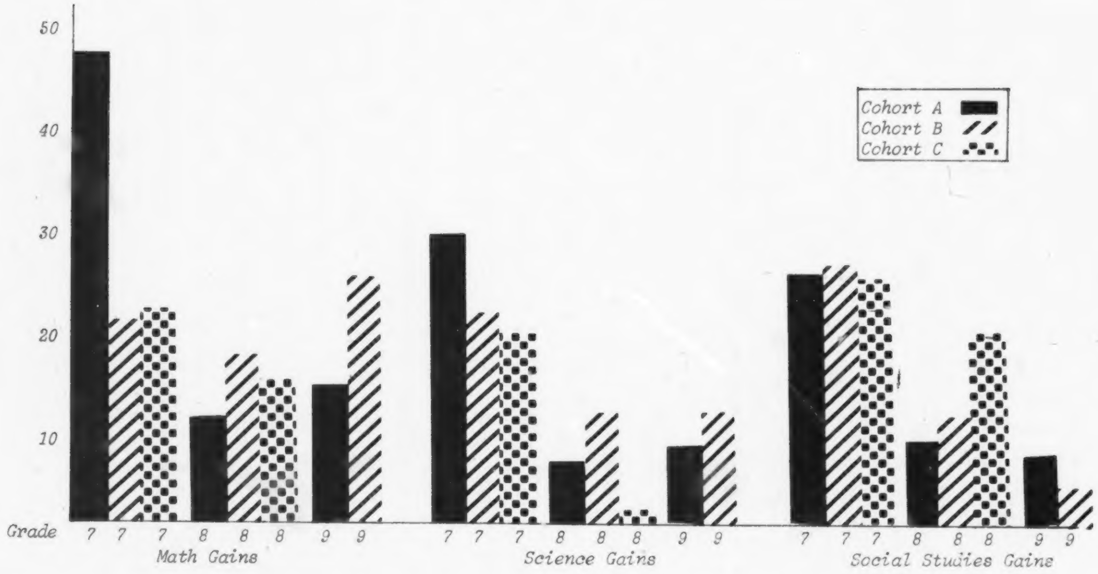
TABLE II-12

Social Studies: Over-all Means, Gains and Percentage Gains

	Cohort A (N=706)	Cohort B (N=519)	Cohort C (N=562)
7th Beginning	26.973	24.194	21.752
7th End	34.207	30.869	27.373
Gain	7.234	6.675	5.621
% Gained	26.8%	27.6%	25.8%
8th Beginning	24.642	23.085	23.289
8th End	27.152	25.951	27.979
Gain	2.510	2.866	4.69
% Gained	10.2%	12.4%	20.1%
9th Beginning	20.035	25.311	
9th End	21.750	26.373	
Gain	1.715	1.062	
% Gained	8.6%	4.2%	

FIGURE II-1

Percentage Gains - Learning Tests
By Grade and By Cohort



eighth grade gains for Cohort A may be misleading. Due to the late arrival of the new curriculum in 1970 and the corresponding delay in test construction, the before tests were not administered until May, three months after the start of the school year. This circumstance limited the observed gain scores since some part of the year's learning appeared in the belated "before" scores.

Achievement According to Instructional Method

Distinct patterns by grade emerged when the ITV and non-ITV subsamples within each cohort were compared. In eight out of nine seventh grade comparisons, the ITV students gained more rapidly than their non-ITV counterparts. Every ITV gain in that grade was greater than 20 percent, while only two of the nine non-ITV gains were that large.

In eighth and ninth grades, the patterns were very different. In science, the non-ITV subsamples outgained their ITV peers. In social studies, the learning performance was mixed with neither instructional method demonstrating a clear superiority. In math, the eighth and ninth grade results resembled those previously reported for seventh grade. ITV subsamples gained more in Cohorts A and C in eighth grade and in Cohorts A and B in ninth grade, while the non-ITV subsample of Cohort B outperformed the ITV subsample in eighth grade. The ratios of ITV to non-ITV mean scores on before and after tests for each student cohort were calculated. These ratios are graphed in Figures II-2, II-3, and II-4 for math, social science, and social studies, respectively. Within a given graph, lines with positive slopes (angled from the lower left to the upper right) represent instances when ITV students gained more rapidly than non-ITV students and negative slopes (upper left to lower right) represent instances when non-ITV classes gained more rapidly.

To illustrate the use of these figures, consider seventh grade math for Cohort A (Figure IV-2, first solid line). At the beginning of the year, the mean of the ITV subsample was 11.97 and the non-ITV subsample was 12.44. The ratio of the two was .96, as the graph indicates. At the end of the year the ITV mean 18.24 surpassed the non-ITV mean of 16.85. The end of the year ratio was then 1.08. The line between these two ratios has a positive slope, reflecting better ITV performance during that year.

By comparing the first ratio reported (beginning of seventh grade) with the last ratio reported (end of ninth for Cohorts A and B;, end of eighth for Cohort C), one can see if any cumulative change occurred. Thus, for Cohort A, math (Figure IV-2, solid lines), the mean of the ITV subsample was only 96 percent as large as the mean of the non-ITV subsample at the beginning of seventh grade; by the end of the ninth grade the ITV subsample's mean was 116 percent of the non-ITV subsample's mean. In fact, for every subject, for every Cohort, cumulative change favored the ITV subsamples. The ITV/non-ITV ratio was always larger at the end of ninth grade than it was at the beginning of seventh. Complete tables detailing before and after scores, gain scores and percentage of gain by subsample, by cohort, by grade and by subject may be found in Appendix D, Tables A, B, and C.

FIGURE II-2

Ratio of ITV Mean/Non-ITV Mean for Math,
All Cohorts, All Grades

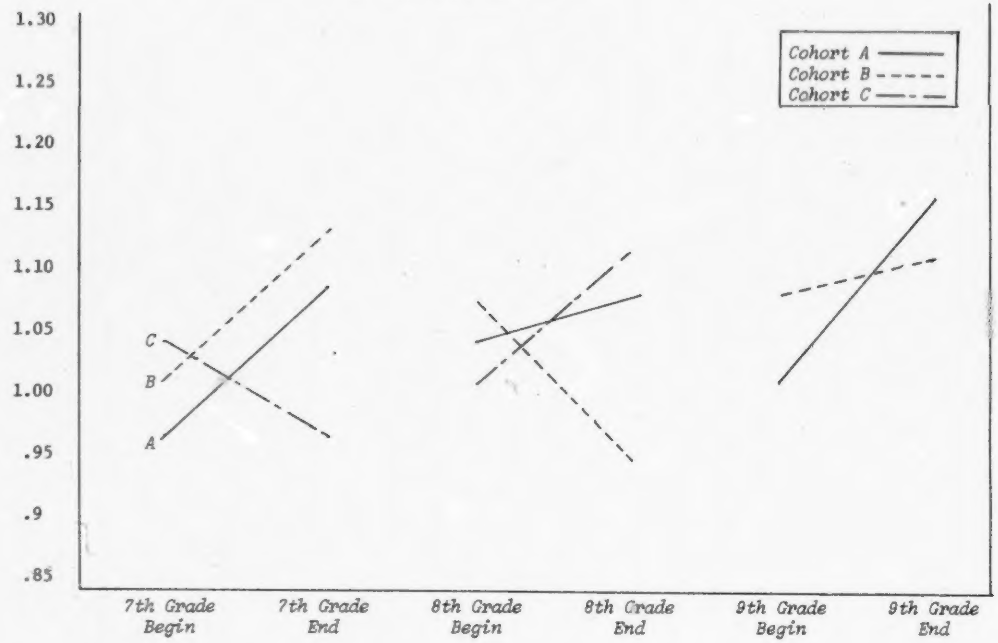


FIGURE II-3

Ratio of ITV Mean/Non-ITV Mean for Science, All Cohorts, All Grades

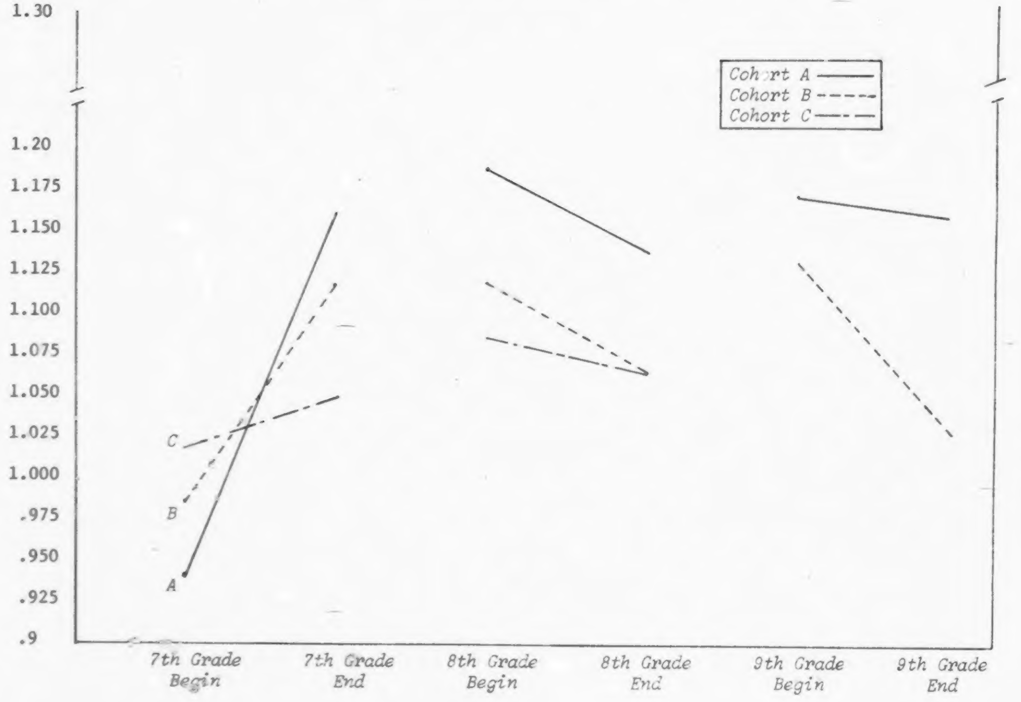
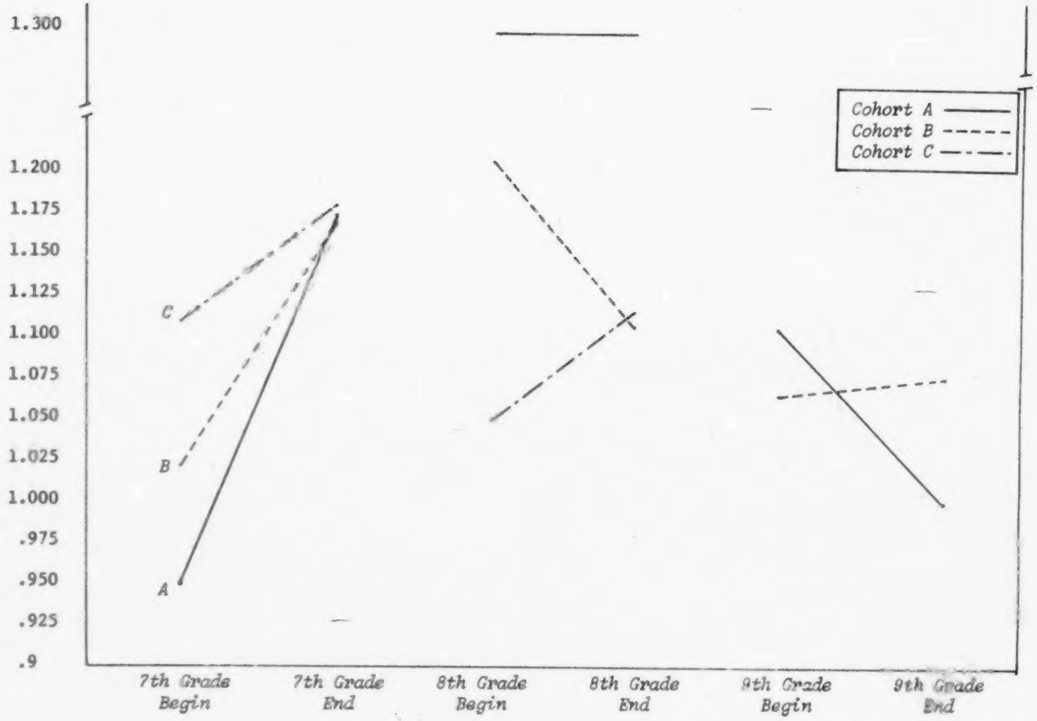


FIGURE II-4

Ratio of ITV Mean/Non-ITV Mean for Social Studies, All Cohorts, All Grades



From another perspective it was possible to examine how many times each of the subsamples gained 20 percent or more on the various achievement tests over three years. In Table II-13, the subsamples are compared according to the size of the gains obtained in each grade: more than 20 percent, between 10 and 20 percent, and less than 10 percent. Once again, the ITV subsample did strikingly better in seventh grade, but about as well, or more accurately, as poorly, as the non-ITV subsample in eighth and ninth grades.

How can the consistent success of ITV in seventh grade and its indifferent performance in eighth and ninth grade be explained? The obvious explanation would be the novelty effect of television. ITV began in the seventh grade and many of its students had no previous exposure to commercial television. Many elements of the ITV system were also new to them, not only televised classes, but also retrained teachers, new subject matter, and student workbooks. It was an exciting time, and one which probably enhanced both motivation and learning. In contrast, students who did not have these innovations may have been less motivated to learn. However, in subsequent years, as the newness of television wore off, its ability to motivate also declined and, in consequence, the learning advantage of the ITV classes also disappeared. The novelty hypothesis questions ITV's capacity to teach better, and suggests that its only advantage may be an ability to motivate, an advantage that may wear off in time. A decline in the favorableness of attitudes toward ITV on the part of students and teachers reflected such a loss of enthusiasm.

TABLE II-13

Number of Cases with Given Percentage Gains by Grade
by ITV and Non-ITV

	7th Grade		8th Grade		9th Grade	
	ITV	No ITV	ITV	No ITV	ITV	No ITV
Over 20% Gain	9*	2	1	2	2	2
10 - 20% Gain	0	6	6	4	1	2
Less than 10% Gain	0	1	2	3	3	2

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*Each case represents a single cohort taking one before and after test sequence in one subject on one grade level.

A second hypothesis, grounded in the particular history of El Salvador's Educational Reform, was that seventh grade TV classes were of higher quality than programs broadcast in later years. The decline in learning may have reflected a decline in production quality and general disruption of the school system brought on by the 1971 teachers' strike. The strike affected television production and utilization in the eighth and ninth grades more than in the seventh grade.

In the history of production detailed elsewhere in this document, the narrative described the special training of the production teams which produced the first series of seventh grade programs in 1969. In the following year, all new teams with only minimum training were assigned to create new eighth grade programs while the original producers worked on the revision of the seventh grade teleseries. In the third year of broadcasting, 1971, the original teams were put to work on the ninth grade programs but that work was interrupted by the two month teachers' strike. Broadcasting of the ninth grade series was not resumed for the remainder of that school year and over-all learning performance was affected in all subjects and in all grades. Because seventh grade learning was better than that of the eighth or ninth grades in the strike year, we suspected that classroom teachers' longer experience with ITV at that level was in part responsible. The only occasion when a non-ITV subsample did better than an ITV subsample in seventh grade was in math in that disrupted year.

In 1972, ITV instruction in eighth and ninth grades improved somewhat. In eighth grade social studies, and in eighth and ninth grade math, the ITV subsample not only outgained the non-ITV subsample, but also achieved the 20 percent gain criterion. Only in ninth grade science was ITV's small gain outdistanced by a non-ITV gain of 22 percent. In ninth grade social studies and eighth grade science, both subsamples gained less than 4 percent.

If the novelty hypothesis completely explained earlier learning results, the 1972 results should not have occurred. Nor should the generally consistent pro-ITV gains in math in eighth and ninth grades have occurred. While the novelty effect no doubt helped the ITV classes in seventh grade, so did superior quality of the telelesson they received. While the eighth and ninth grade classes did not have the extra motivational push attributable to the newness of ITV, they also suffered from inferior programs, greater disruption from the strike, and perhaps less reliable achievement tests. These failures were particularly apparent in science, and least apparent in mathematics.

It was ironic that science proved to be the least successful ITV series, at least in terms of learning. It has often been suggested by advocates of school television that ITV's ability to expose all science students to experiments and demonstrations unavailable in poorly equipped schools is among its greatest assets. The fact that science ITV classes learned less than non-ITV classes in every case after seventh grade and that in none of those cases were gains more than 11 percent over before-test means, indicates that ITV, experiments and all, did not raise and may have lowered achievement.

Summary and Implications

On a regular basis throughout 1969-1972, the evaluation team administered General Ability and Reading tests as well as mathematics, science, and social studies achievement tests to three cohorts of Third Cycle students. Cohort A, which began seventh grade in 1969, included students studying with television and other elements of the Reform and students learning in the traditional way. Cohorts B and C, which started seventh grade in 1970 and 1971 respectively included only students from Reform classes, but these groups were divided into ITV and non-ITV subsamples.

1. In all three cohorts, the ITV students gained from 15 to 25 per cent more on the General Ability tests than did their non-ITV peers. The advantage was unaffected when controls for socioeconomic status and for individual student characteristics were applied. On Reading tests, ITV and non-ITV students gained about the same.

2. ITV students in each cohort also gained more than non-ITV students on the achievement tests administered in seventh grade. The ITV advantage in mathematics was maintained through ninth grade. In social studies, eighth and ninth grade achievement results were mixed; sometimes ITV students gained more, sometimes non-ITV students gained more. In science, non-ITV students gained more in both eighth and ninth grades. Over-all, ITV students in all cohorts completed ninth grade (eighth grade in the case of Cohort C) with an achievement advantage over non-ITV students.

3. Older children within a cohort (those who had started school late, repeated a grade or for some other reason interrputed their education) gained less on the General Ability and Reading Tests than did younger children in the same cohort. Also, boys gained more than girls. These two variables, as well as father's education, family wealth and urbanization, were positively related to students' scores on the basic skills tests at the beginning of seventh grade.

4. In the final analysis, television and the other reform programs did not mediate the effects of background characteristics on basic skills test performance. However, there was some evidence that the learning advantage of urban over rural children was smaller in the ITV subsamples.

At the outset of the Reform no criteria were established to judge learning effectiveness. No one in the Ministry of Education or in any of the outside organizations providing technical assistance suggested how much extra learning should be expected to justify the investment in so many innovative programs. Nevertheless, the Educational Reform and particularly its ITV component were successful in enhancing student learning. The test results revealed a clear trend: ITV learning gains were significantly greater than the non-ITV gains in most comparisons. Reform classrooms with ITV, retrained teachers, a revised curriculum, and new materials proved to be a better learning environment than either traditional classrooms or classrooms with all elements of the Reform except for television.

How Much Learning Can Be Attributed to Television?

From one perspective, the learning results may be misleading. The advantage of the Reform with ITV classrooms over the traditional classrooms (Cohort A) was about the same as the advantage of the Reform with ITV classrooms over the Reform without ITV classrooms (Cohorts B and C). It was reasonable to assume that if the other changes of the Reform had been introduced without ITV, they would not have produced learning gains significantly greater than those of the traditional system.

On the other hand, would it not be just as reasonable to assume that ITV alone was responsible for increased learning? In fact, there was no evidence to suggest that if ITV had been introduced without the rest of the Reform, the learning advantage over the traditional system would have occurred. On the contrary, the non-ITV components of the Reform were essential to its success. The year's retraining given each teacher surely improved the utilization of the television lessons, as did the student workbooks and teachers' guides, which provided a reinforcing structure to the television lessons. When the television's schedule was interrupted, or when the teleclasses were confusing, these supplementary materials provided additional sources from which the content could be learned.

The major effort to integrate ITV into classroom instruction was then largely responsible for the students' learning gains. Because the teaching materials were designed to accompany the telelessons, because teachers were retrained with the specific understanding that future instruction would involve television, television was well integrated in

Salvadoran classrooms. Television did not prove to be an intrusion as it might have been had ITV been introduced without the other components of the Reform.

The Quality of Learning

The most impressive gains in learning for the Reform-ITV system were on the General Ability Tests. Educational planners often hope that the instructional innovations they adopt will result not only in increased student learning of specific content areas, but also some improvement in students' general intellectual skills. In El Salvador, students gained on their subject tests and they improved on the numerical, verbal and non-verbal reasoning abilities as well.

On the other hand, improvement in reading skills did not accelerate under the Reform-ITV system. Furthermore, no evidence was found to suggest that the existing level of reading skills will improve under the Reform. Fundamental changes in the Spanish curriculum and the Spanish teleseries may be required.

Finally, despite a cumulative advantage in favor of the ITV classrooms, learning in specific courses was not satisfactory. Only in seventh grade did students consistently gain as much as 20 per cent over the course of a year. In eighth and ninth grades, learning in science and social studies, and sometimes mathematics, was particularly poor. While some of the seventh grade courses' relative success may be attributed to the novelty effect, a significant portion remains in the failure of the eighth and ninth grade telecourses.

Recognizing this problem, El Salvador invested considerable resources in remaking programs and improving the teaching capabilities of its production staff. We stress such difficulties here both to endorse the ongoing effort in El Salvador to improve program quality and in order that future investors in ITV systems will be forewarned.

An investment in ITV is not only an investment in hardware. Adequate production facilities are certainly essential, but a more important investment is in programming and in good production people. Producers must be carefully recruited and thoroughly trained. They must receive adequate salaries so that they are not tempted to leave for better jobs. Perhaps most important, they must be given sufficient time to make good programs. Poorly paid producers with inadequate training and little time to prepare programs do not produce good telecourses and, as the El Salvador data indicates, learning may suffer as a result.

ITV and Learning Opportunities

There was no evidence that learning disparities within classrooms were reduced by the Reform-ITV system. Younger children continued to do better than older children, and boys continued to do better than girls in both ITV and non-ITV classrooms. Disparities in intellectual skills at the beginning of seventh grade related to socioeconomic variables were maintained throughout the years of Third Cycle.

At the same time, there was some evidence that ITV and other elements of the Reform may have mediated differences between classrooms related to urbanization. In general, rural classrooms had poorer facilities than urban ones and their teachers were less well trained and less experienced. Television may have been the only resource that was apportioned equally to rural and urban classrooms. As a result, while non-ITV rural classrooms continued to lose ground to urban classrooms, rural ITV classrooms achieved about the same as urban ITV classrooms. This offers hope that where unequal performance among classrooms is the result of unequal provision of resources, ITV can help to equalize student performance.

Footnotes

(1) Both the General Ability and Reading tests were part of the Inter-American Series published by Guidance Testing Associates of Austin, Texas. Level 3 tests were administered to Cohort A in seventh grade in 1969; at all other times Level 4 exams were used. In large part the Spanish versions of the tests were validated in Puerto Rico. The following chart details the subsections of the tests, the number of questions in each, and their reliabilities.

		Reliabilities	
		Coh. A	Coh. B
General Ability	150 items	.87	.80
Verbal Ability		.82	.75
Sentence Completion	25 items		
Word Relations	25 items		
Non-Verbal Ability		.80	.87
Analogies	24 items		
Classification	26 items		
Numerical Ability		.59	.67
Computation	26 items		
Number Series	24 items		
Reading	125 items	.79	.77
Vocabulary	45 items	.70	.83
Speed of Comprehension	30 items	.48	.70
Level of Comprehension	50 items	.64	.63

Reliabilities are those of the tests administered in the eighth grade to 900 students of Cohort A and 700 students for Cohort B. It is calculated according to the following formula (Heise, 1969)

$$rel_2 = \frac{r_{12} \times r_{23}}{r_{13}}$$

where r_{12} refers to the correlation of the exams administered at times one and two.

The reliabilities indicate that the tests were adequate, at least on the surface, for El Salvador. With the exception of the low numerical ability reliabilities for both cohorts, and the low reliability for Speed of Comprehension for Cohort A, these figures were close to those reported by Guidance-Testing for parallel forms reliabilities on small Puerto Rican samples.

The contribution of the several components of each test to the total test mean are remarkably stable over time and across cohorts. As the total test mean increased for a cohort, so did each of the subtest means. Gains were not weighted toward verbal ability and away from numerical ability for example. Also despite the changes in the socioeconomic makeup of succeeding cohorts, the contributions of the subtests varied minimally.

Subtest Means as a Percentage of Total Test Mean

Subtest	Coh. A.		Coh. B		Coh. C	
(date)	3/70	10/71	3/70	10/72	3/71	10/72
G.A. Verb.	37%	37%	34%	37%	33%	36%
G.A. Non-Ver.	37%	37%	40%	37%	41%	38%
G.A. Numeric.	26%	26%	25%	26%	26%	26%
Rd. Vocab.	43%	45%	45%	45%	45%	45%
Rd. Speed	23%	23%	22%	22%	22%	23%
Rd. Level	34%	33%	33%	33%	33%	32%

(2) Throughout the analysis reference will be made to the three cohorts, named A, B and C. Cohort A includes those students who entered seventh grade in 1969 and graduated ninth in 1971. Cohort B refers to the students who entered in 1970 and left in 1972. Cohort C includes 1971 seventh grade enterers whom we studied for two years until they completed eighth grade. In order to be included in the analyses of this final document, students had to have completed all three years (Cohorts A and B) or both years (Cohort C).

(3) A correlation is a statistical index of the strength of the relation between two variables. It measures on a scale from -1 to +1 the tendency for an individual to have the same position or rank on the distributions of two characteristics. If on the average, for example, a students rank on a General Ability Test was similar to his rank on a Reading test, (ie. the students with high General Ability scores had high Reading scores and vice versa) the two variables, Reading and General Ability, would have a correlation approaching +1.0.

(4) While regression equations are complex to compute, their logic is fairly straightforward. In this case an attempt is made to write a single equation to predict information in (for example) General Ability change scores using six predictor variables (age, sex, father's education, mother's education, wealth and urbanization). One wishes to weight these predictor variables so that they tell us as much as possible about the change scores. As a criterion we ask that, on the average, the difference between the the General Ability change score we can predict knowing the six control variables and the actual General Ability change score be at a minimum.

The standardized regression coefficients reported here as weights for the predictor variables are related to correlation coefficients. They also vary from - 1.0 to + 1.0, and give an estimate of the relation of the individual predictor variable to the dependent variable. However, a series of correlation coefficients often overlap. For example, for Cohort B, age and General Ability have a correlation of -.376. Father's education and General Ability correlate at r=+.321. But these correlation coefficients are not independent of one another. Age also correlates with father's education (r= -.317). It is clear that some of the information about General Ability that we can predict from father's education is the same as some of the information that we can predict from age. The regression coefficient, in contrast to the correlation coefficient, will reflect this overlap; any common influence of two or more predictor variables is shared by them and their regression coefficients are reduced accordingly.

(5) The measurement model which was applied to the General Ability and Reading scores for Cohorts A and B, derives from the work of Wiley and Wiley (1970). It seeks to estimate the amount of true and error variance contained in each of the score distributions from each test administration.

Given three test scores for each student, the method permits the division of the variance of the final test score into variance predicted from the first test, variance predicted from new information in the second test, error variance and new variance unpredictable from prior test scores.

Formally, the measurement model would be stated as follows.

Test1 = A + e<1>

Test2 = b*A + B + e<2>

Test3 = c*(b*A + B) + C + e<3>

where Test1,Test2 and Test3 are the observed test scores
A, B and C represent that element of the true score which first appeared at Tests 1, 2 and 3.
b and c are scale coefficients
e<1>, e<2> and e<3> are error parameters

With three tests the model is exactly identified if one assumes that each test has equal error variance. (Actually there is some dispute as to the proper assumption; Heise (1969) recommended the assumption of equal reliabilities, or that the ratio of error variance to total variance be constant over the three tests. For our data, however, we believed that the equal error variance assumption was more defensible. We know that total variance increased for succeeding tests, and we have no reason to believe that error variance increased as students became more and more familiar with the exams. If anything we expect that error variance declined over time).

For both basic skills exams, for both Cohorts, we obtained estimates of the variances of A, B and C, of the constant error variance, and of the scale parameters b and c. We then were able to calculate the covariances of each of the A, B and C terms with the control variables. With covariances available, the estimation of regression equations could be done by standard computer programs.

In one situation (non-ITV subsample, General Ability) an additional assumption (fixing the variance of C at the same magnitude as the variance of C for the full sample,) was necessary, since the observed estimate of that variance was inconsistent with what was considered reasonable. While such a post hoc adjustment is questionable, it was taken to permit the completion of the analysis. Since it was a conservative adjustment, in that it reduced the size of coefficients in the regression equations, we considered it acceptable.

(6) How accurately each test sampled its curriculum must remain in doubt. Describing the process of test construction may provide insight into the problems. Between each school year, the curriculum writing division of the Ministry of Education worked under great pressure to finish curricula necessary for the following school year. Usually, these were not complete until two months before the school year was to begin. In order to have tests geared to each curriculum for administration at the beginning of the school year, the document was rushed to Educational Testing Service. Usually curriculum writers or advisors to the Ministry had indicated which concepts were most important. E.T.S. then wrote a first draft of the test. When possible, questions were borrowed from tests used elsewhere; otherwise new questions were written. A Spanish version of the test was then sent back to El Salvador for review by the television production teams.

Ideally the content of the test was to be checked against the instruction the TV team was planning for the year. Since the TV teams not only prepared the teleseries, but also the teachers' guides and student workbooks they had de facto control over what parts of the curricula would in fact be emphasized and which parts ignored.

Unfortunately the TV teams themselves worked under great pressure, particularly in the early years. At best they had two to three weeks lead time on production air dates. When the first drafts of the tests were made available to them, they had only a vague notion of what they would be teaching even a month hence, never mind what they would be teaching at the end of the year. Thus their review of the test touched content only lightly, the major contribution was to language, insuring that test usage conformed to Salvadoran usage.

We do know that the great majority of the questions on the tests were in fact covered during the school year. For several of the tests we matched each question to the lesson which taught the material it reflected. However, we cannot say that the emphasis of the TV classes was the same as the emphases of the test. The complete content analysis of the TV lessons which would have been necessary to deal with this has not been done.

During 1972, the tests were revised in El Salvador by the evaluation team. They were constructed so as to reflect the changing curricula and television series, not only because the topics had changed, but because the types of learning expected had changed. Greater abstraction (comprehension, analysis and synthesis on Bloom's Taxonomy) played a more important role, and memory a less important one. It was hoped that a more accurate sample of the curricula could be obtained with tests constructed in El Salvador in coordination with the ITV staff.

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Chapter III

Student Attitudes

Researchers often divide the potential outcomes of an educational innovation into two broad areas. The first, that of cognitive effect or learning, has been treated extensively in the previous chapter. In this chapter and in the next, the second area, that of affective development and, particularly, the evolution of student attitudes under El Salvador's Reform is examined. The intent was to discover what other changes, besides increased learning, occured in the children exposed to the new technology.

The affective studies of students were divided into two subareas. This chapter treats what can be called the attitudes of internal interest. These attitudes, toward ITV, toward particular teleseries, and toward particular school subjects, were studied primarily because they were thought to influence learning. In the following chapter student aspirations vis-a-vis educational and career opportunities, are considered along with other attitudes that are of interest beyond the school system. It was important to know whether ITV and the Educational Reform affect these attitudes, regardless of whether they are related to cognitive outcomes.

The first three sections of this chapter are descriptive, outlining general student attitudes toward ITV, toward particular teleseries and toward specific subjects, as each changed over time. The final two

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sections consider what kinds of students (according to background variables) held particular attitudes and the relation of those attitudes to achievement.

General Attitudes toward ITV

During the four years of research, a wide variety of questions were devised to tap general attitudes toward ITV. (A sample student survey is included in Appendix C.) As the particular conditions of given school years changed, so did the attitudes we wished to measure. In addition, interim analyses of attitude items used on the earlier questionnaires indicated the need for both substantive and stylistic revisions. As a result, no questions were repeated on every questionnaire in every year with exactly the same format. There were, however, a series of four questions, generally representative of students' perceptions of ITV's place in their school, which were used in both 1971 and 1972 in identical form. Cohorts A and B responded to these questions four different times; Cohort C only twice.

Each of the four questions was a statement expressing a point of view about some aspect of ITV. Students responded on a Likert type scale, choosing one of five alternatives ranging from "completely agree" through a neutral "I am not sure" to "completely disagree". Three of the statements were phrased positively (i.e., in favor of ITV) and one was phrased negatively. In Table III-1, the four statements are presented, along with their respective reliability coefficients estimated from Cohort B data.

TABLE III-1

General Attitude Questions Towards ITV (reliability estimates)

1. You learn more during class hours with television than during class hours without television.

Completely Disagree	I Disagree	I am not Sure	I agree	Completely Agree

Reliability (Cohort B, Oct. 70) Estimate = .521

2. Classes are more difficult with television.

Reliability Estimate = .515

3. One can see the Teleclasses clearly.

Reliability Estimate = .428

4. It appears that classroom teachers prefer to teach with ITV.

Reliability Estimate = .531

Only ITV students' responses to these questions are reported, although in the first years an attempt was made to obtain responses from non-ITV students as well. This was an unsuccessful effort, since many non-ITV students did not express an opinion on the grounds that they had no previous experience with or knowledge of ITV. Using the responses of those non-ITV students who did answer would, therefore, have biased our comparisons, since one could not prove that those who decided to respond were representative of the non-ITV sample.

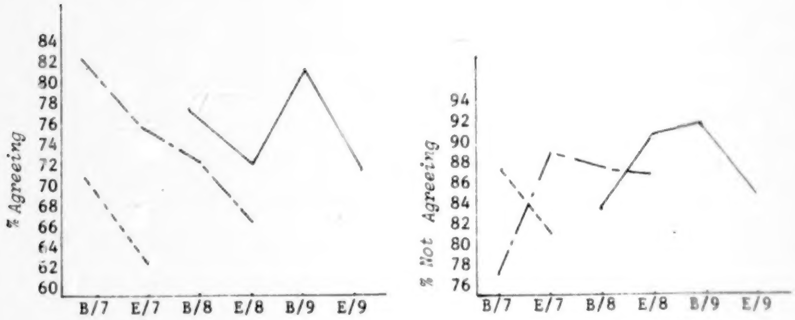
Over-all, responses to the four questions gave a clear picture of high initial enthusiasm for ITV which declined as students moved through the Third Cycle, but which still remained favorable in the end. They also indicated that each cohort was, on the average, less favorable than its predecessor. These trends will be spelled out below.

Figure III-1 presents the percentages of students in agreement with each of the statements favorable to ITV and the percentage not agreeing (including those neutral and those in disagreement) with the statement unfavorable to ITV. The evolution of attitudes toward ITV was plotted through the replication of measures during the students' careers in Third Cycle. Although precise percentages are reported, the reader would be wise to interpret these with care. They are fairly gross measures with neither high reliability nor stability.

Although 82.1 per cent of all Cohort B students at the beginning of seventh grade agreed that they would learn more from ITV classes than from non-ITV classes, this did not mean that all these students had weighed the issue carefully on its merits and then responded

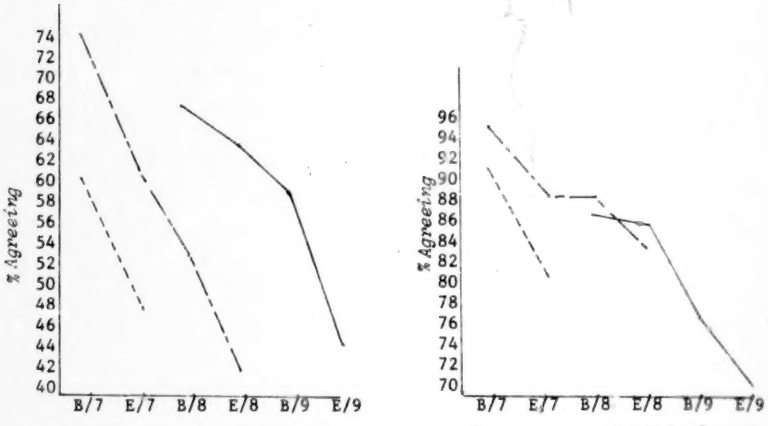
FIGURE III-1

General ITV Attitudes



"You learn more during class hours with television than during class hours without television."

"Classes are more difficult with television."



"It appears that classroom teachers prefer to teach with ITV."

"One can see the Teleclasses clearly."

Cohort C (N from 412 to 436) ----
Cohort B (N from 417 to 445) —— –
Cohort A (N from 522 to 563) ——

accordingly. There were a number of biases and sources of error which could have influenced their responses. The students were young and had little experience with this type of question format. They were not used to being asked their opinions and, on some of the questions, they probably had no fixed opinions. Some were consistently conservative and tended to choose the neutral alternatives, while others declared themselves in complete agreement or disagreement with almost every statement. In addition, the questionnaires were administered by the ITV Evaluation staff with classroom teachers often looking over their shoulders. These conditions may have lead students to express pro-ITV responses and/or to conform to known teacher opinions.

It was assumed, however, that sources of error and bias were constant across measurement occassions and across cohorts and it was therefore possible to compare the percentages with greater confidence. Each cohort's early attitudes were compared with its later attitudes and each cohort's attitudes were compared with those of the other two cohorts. Thus, when we found that Cohort B's agreement with the statement, "You learn more during class hours with television than during class hours without television," dropped from its original 82.1 percent to 65.5 percent in two years, it was obvious that a noteworthy negative shift had occurred.

If any single question could be considered the basic measure of ITV attitude, it was the one comparing learning with and without ITV. It was first asked of Cohort A at the beginning of eighth grade. As Figure III-1 indicates, student response thereafter for Cohort A was cyclical.

At the beginning of both eighth and ninth grades, expectations were high; yet by the end of each year, they had declined.

ITV students of Cohort A were the pioneers of the Educational Reform, and they may have felt a special excitement as they entered the classroom each year. But the reality of each year apparently did not reward that optimism. In the eighth grade these students were treated to poorly made teleseries; in the ninth grade a teachers' strike resulted in the suspension of ITV broadcasts for the last four months of the school year. In its first two years, Cohort B declined nearly 17 percent in agreement with the statement concerning improved learning with ITV. At parallel measurement occassions (beginning and end of eighth grade) Cohort B had an average of [illegible] percent less agreement than Cohort A. Similarly, Cohort C started with nearly 12 percent less agreement than Cohort B at the beginning of seventh grade, and declined even more rapidly. By the end of seventh grade, Cohort C students believed less that they could "learn more from ITV" than Cohort B students had at the end of eighth grade or than Cohort A students had when they graduated from ninth grade.

Certainly these were pessimistic trends. Perhaps, however, they should have been expected. Many students entering seventh grade had no experience with instructional television. Their prior television experience had been with Popeye cartoons, Bonanza adventures and soap operas. Who can blame them for high hopes for ITV? That teleseries made with low budgets in a crowded studio by inexperienced teleteachers could not match students' expectations should not be surprising. It might even be that the succeedingly lower optimism at the beginning of seventh grade for each cohort reflected some passing down of experience. Perhaps older brothers and sisters had warned their siblings that television in the classroom was really more classroom than television.

Also, one should not lose sight of the fact that despite the decline, the vast majority of students continued to feel they learned more with television. Even in Cohort C, the least favorable group at the end of seventh grade 63 percent of the students believed that they learned more in ITV classes than in non-ITV classes. Twenty-seven of the remaining 37 percent were neutral, they "were not sure," and only 10 per cent indicated outright disagreement, believing that learning was not enhanced with ITV.

Mean responses to the statement "One can see television classes clearly" followed a similar pattern. In all three cohorts, initial agreement declined but remained fairly high. While on its surface the statement appeared to deal with physical aspects of reception, it may be that the decline in mean agreement reflected more than just technical problems or problems related to the children's eyesight. More crowded and noisier classrooms, and a growing dissatisfaction with the teleseries may have convinced students that they could not see the teleclasses clearly.

The statement "It appears that classroom teachers prefer to teach with television" was consistently the least agreed to of the four attitude items, and the one that showed the sharpest decline in favorableness. The dip below majority agreement, which appeared in all three cohorts in 1971, may have been a direct result of the teachers' strike that year. Among the issues stressed by the teachers' union was their disagreement with the Ministry's decision to invest in ITV instead of teachers' salaries or classroom teaching materials. Perhaps students who never consciously considered whether their teachers liked or disliked teaching with television began thinking about it during the strike.

However, as important as the strike was in accelerating the decline in teachers' attitudes, their attitudes were already in decline before the strike, if student attitudes were correct. This is partly corroborated by data on teachers' attitudes reported in Chapter VI. Perhaps the uneven quality of teleclasses and the improving self-confidence of classroom teachers after retraining led to the perception of teacher dissatisfaction on the part of students.

In any case, if teachers were decreasingly happy about ITV and were communicating this attitude to their students, one can imagine that some damage to learning may have resulted. Use of ITV in El Salvador war predicated on the notion that teleteacher and classroom teacher would work in partnership. If cooperation between the two were to be replaced by tension, the instructional system as a whole would undoubtedly suffer.

Attitudes Toward Specific Teleseries

To complement the investigation of general attitudes toward ITV, student attitudes toward particular teleseries were measured. For these students were asked to select one of three futures for a given teleseries: 1) that the use of ITV be curtailed for that subject, 2) that the use of ITV be continued at its present level (usually two or three class hours used television out of four or five class hours of that subject per week), or 3) that the use of ITV be expanded to all class hours in that subject. The investigators were particularly anxious to learn how many students would choose to do without ITV entirely. It was one thing to grumble about ITV or to express general dissatisfaction with it, but an entirely different thing to suggest doing without it.

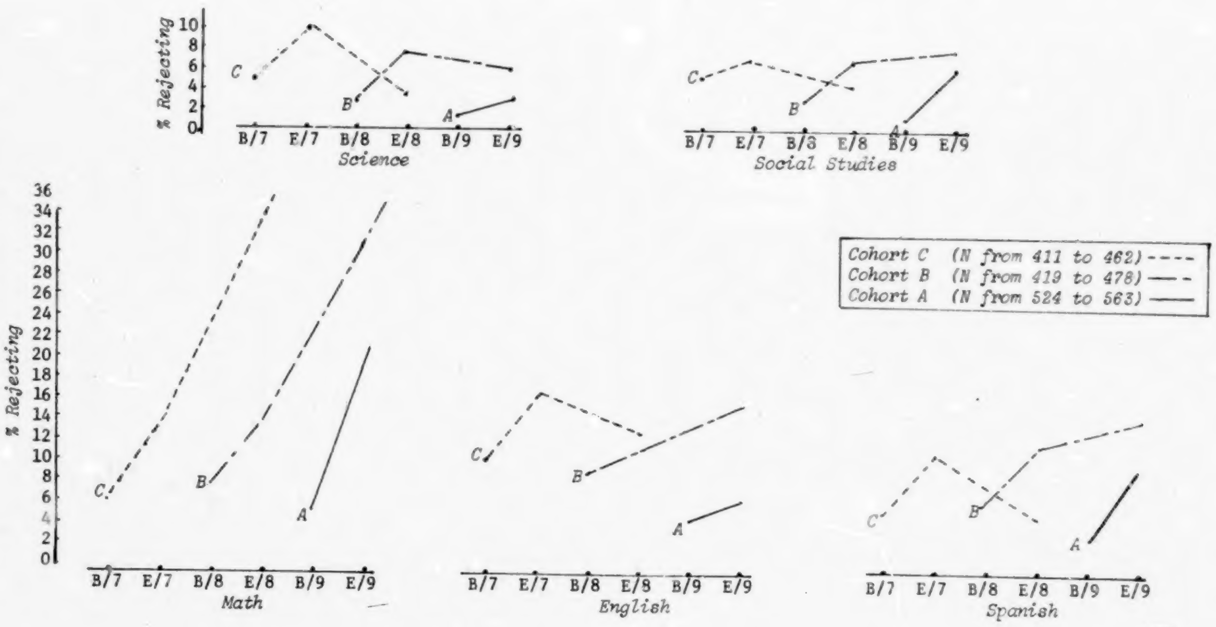
As Figure III-2 makes clear, very few students were willing to give up television. For science and social studies, no more than 10 percent ever rejected ITV; for English and Spanish at most 17 percent and 15 percent, respectively, preferred classes without ITV.

Only in mathematics was there a large number of students who desired to see ITV eliminated. At the beginning of ninth grade, only 5 percent of Cohort A students rejected math via ITV; by the end of that year, the number had grown to 20 percent. Similarly, the rejection of Cohort B students increased from 7 percent to 33 percent in their first two years of Third Cycle. And Cohort C, most negative of the three cohorts, went from a 6 percent to a 36 percent level of rejection between the beginning of seventh grade and the end of eighth.

No conclusive evidence was gathered on how these attitudes related to learning. In fact, as was reported in the previous chapter, mathematics was the only subject in which the ITV subsamples consistently outachieved the non-ITV subsamples in eighth and ninth

FIGURE III-2

Percentage Willing to do without Teleseries



grades. In contrast, science, the most popular of the teleseries, had the least favorable learning data. In eighth and ninth grades, non-ITV students generally outgained ITV students.

The declining regard for the mathematics teleseries was only partly a reaction to the quality of the teleseries itself. In addition, students were frustrated with the subject. The subject's special vocabulary, its abstract concepts and rules, and its cumulative content structure, requiring a student to master the early lessons or risk being confused on later ones, all demanded a great effort on the student's part. That effort was probably more than that demanded in science and social studies where one could follow a particular telelesson without having understood the previous ones, and where one did not have to deal constantly with abstraction. That the particular problem of mathematics was more than simply frustration with the teleseries will be evident from the data in the next section.

Two important conclusions can be drawn from the students' attitudes toward the teleseries. First, the simple introduction of television was not sufficient to counteract a long history of discomfort with a subject (in this case mathematics). The essential finding was that ITV students' attitudes toward math were no more favorable than those of non-ITV students. It has been suggested that primary school teachers were poorly equipped to teach the required curricula in math (and poorly retrained to teach modern math). As a result, students arrived in seventh grade both with inadequate preparation and a belief that mathematics was beyond understanding. Certainly one major hope for the introduction of television could have been that the oft-reported fear of math would dissipate.

The low scores on the before tests in math achievement testify to the inadequacy of the students' primary training. And, although there was some learning (particularly among ITV classes) during each school year, any educator knows that a student who dislikes and is confused by a subject is unlikely to learn it well. It was clear that the math teleseries did not alleviate the students' basic dislike for the subject. These data are not cited to condemn the math teleseries; students' superior learning in the subject belies any such conclusions. Rather, it suggests that the task of the math teleseries was more difficult than that of other subjects.

The second major conclusion is that liking a particular subject does not always lead to learning it. The fact that Salvadoran students liked science and ITV generally did not result in great learning increments. While liking is probably a valuable precondition for strong learning, it is clearly not a sufficient precondition and, as long as the objective of schooling is not only to generate enthusiasm for science, but also to teach the cognitive skills of science, keeping students happy is simply not enough.

Attitude Towards Subjects

ITV and non-ITV students were asked to choose their favorite and least favorite subjects among math, science, social studies, English, and Spanish. Responses were quite unstable over time. Table III-2 reports the percentage of Cohort B students who chose each subject as their most or least liked, averaged over the four measurement waves. It also specifies the percentage of students who chose a subject at least once and the percentage who mentioned the same subject three or four times. Students were not consistent; relatively few chose any subject as most or least favorite on all four measurement occassions.

In Table III-3, student preferences are displayed according to ITV/non-ITV instructional condition. To obtain an overall index for each subject, the average percentage of students disliking a particular subject over the four times of measurement was subtracted from the average percentage liking it. As can be seen, attitudes toward science and social studies were positive and consistent across both ITV and non-ITV subsamples. In Spanish, attitudes were consistently negative. Although mathematics was disliked by both student subsamples, ITV students were particularly negative. This occurred despite the fact that ITV students outperformed their non-ITV peers in math.

English was the one subject about which ITV and non-ITV subsamples held very different attitudes. ITV students chose English as their second favorite subject while non-ITV students ranked it second to last. The English broadcasts were generally regarded as the most innovative of all the teleseries. In contrast, many classroom teachers lacked knowledge of the language and, given no television broadcasts to provide structure, they may have been unable to present more than rote lessons, stressing vocabulary and repetitive practice of grammar. No measure was

TABLE III-2

Cohort B - Attitudes Toward Subjects*

	Average % choosing subject 4 times	% Choosing at least once	% Choosing at least 3 times
Favorite Subject (N=706)			
Mathematics	18.7	38.8	8.5
Science	26.4	50.7	14.7
Social Studies	23.6	47.6	12.2
English	25.9	48	14.3
Spanish	5.3	14.2	1.0
Least Favorite Subject (N=679)			
Mathematics	32.6	54.1	20.2
Science	9.0	19.7	3.7
Social Studies	14.5	29.0	5.8
English	19.4	36.4	9.1
Spanish	24.5	44.3	12.8

* 4 measurements (beginning and end of seventh and eighth grades)

TABLE III-3

Cohort B (ITV vs. No ITV) - Attitudes Toward Subjects

	Average % Favorite		Average % Least Favorite		Index of Average Attitude (Favorite-Least Favorite)	
	ITV	No ITV	ITV	No ITV	ITV	No ITV
Mathematics	16.1	24.3	34.9	27.6	-19.2	-4.2
Science	27.3	24.3	9.7	7.6	+18.1	+17.4
Soc. Studies	23.0	24.9	13.8	16.0	+9.4	+9.3
English	29.2	18.9	15.7	27.4	+13.3	-8.8
Spanish	4.3	7.6	25.9	21.4	-21.7	-13.6
N=	492	224	462	217	462	217

made of learning from the English teleseries, but it was apparent that ITV was quite successful in stimulating interest in the subject.

Who Holds What Attitudes?

Sophisticated models were not devised to explain the origins of student attitudes. Because the attitude measures were not reliable enough to bear the weight of such models, only bivariate analysis comparing background variables with attitudes were conducted. Complete correlation matrices of all the control variables (sex, father's education, wealth, age, urbanism and General Ability) with the attitude measures described in the previous sections are presented in Appendix D, Tables D, E, and F. In this brief section the trends revealed in those tables are summarized.

Only urbanization and General Ability were related in a consistent way to the general ITV attitudes. Rural children were likelier than urban children to believe that they would learn more from ITV than from non-ITV classes, that they could see ITV clearly, and that their teachers preferred to teach with ITV. They were less inclined to believe that ITV classes were more difficult than non-ITV classes. High scorers on the General Ability test also tended to reject the notion that ITV classes were more difficult than non-ITV classes, although the high relation at the beginning of seventh grade (r=-.30) was diminished by the end of eighth grade (r=-.08.)

On the whole, the control variables were better predictors of attitudes toward specific teleseries than they were of general attitudes toward ITV. Older children, poorer children, rural children, and children whose parents had little schooling tended to be more positively disposed toward the teleseries than were their more advantaged peers. Similarly, children who scored lower on General Ability tests were more favorable toward the ITV series. The sole exception to these patterns was the science teleseries which was equally popular among children of all socioeconomic classes and abilities.

Sex was related to student attitude toward two teleseries, Spanish and English. Girls tended to be more positve than boys toward both series and they were particularly enthusiastic about English.

Attitudes toward individual subjects, irrespective of television, were also apparently influenced by the control variables. Science was particularly well liked by wealthy, urban, young and male students, while Spanish was particularly disliked by these same groups. Boys more than girls preferred social studies and math, and the girls liked English more. Older students and students who scored lower on General Ability tests disliked English and liked Spanish more than their younger and higher General Ability scoring classmates.

Summarizing the data in this section, disadvantaged children appeared to be slightly more enthusiastic about ITV than their more advantaged peers. Sex influenced the choices of favorite subject more than any other variable, boys leaning toward science, social studies and math, girls toward English and Spanish. Brighter students, like the advantaged students on the other control variables, were less enthusiastic about ITV teleseries than their classmates who scored lower on General Ability. The former also chose English and math as their favorite subjects and, with great certitude, Spanish as their least liked subject.

Attitudes and Learning

Thus far, we have considered the nature of student attitudes and some of their correlates. However, implicit in the measurement of attitude is the belief that attitudes affect student performance in school. Other things being equal, a well-motivated student should learn more than one who is not well motivated. Furthermore, a student with a strong interest in a subject is more likely to continue to study it in later years and perhaps to choose a career that will demand knowledge of it.

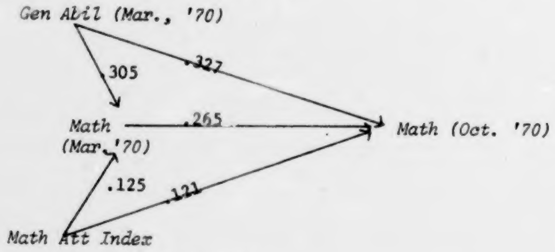
Attitudes were also related to learning. In general, attitude toward a subject was positively related to achievement in that subject, over and above the influence of general ability on both attitude and achievement. However, attitudes toward specific teleseries were unrelated to achievement in those subjects.

In Figures III-3, III-4, III-5 path analyses for math, science and social studies learning are pictured. In each case a beginning of year achievement score was predicted from General Ability and attitude toward the subject. The end of year score was then predicted from all three

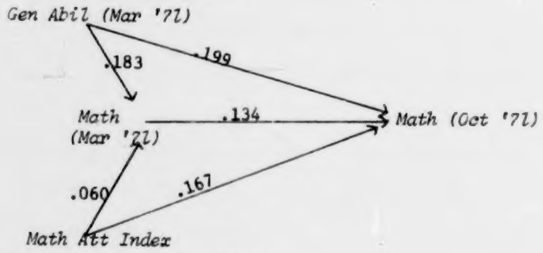
FIGURE III-3

Math Attitude Models: Cohort B

Predicting Math score in October, 1970


Gen Abil (Mar., '70)
.305
.327
Math (Mar. '70)
.265
Math (Oct. '70)
.125
.121
Math Att Index

Predicting Math score in October, 1971


Gen Abil (Mar '71)
.183
.199
Math (Mar '71)
.134
Math (Oct '71)
.060
.167
Math Att Index

Predicting Math score in October, 1972

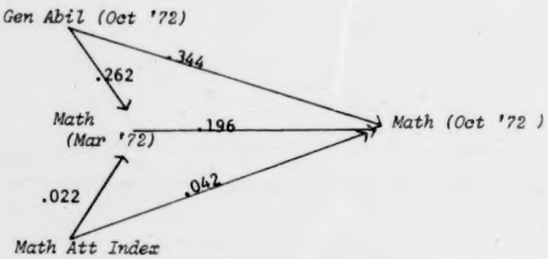
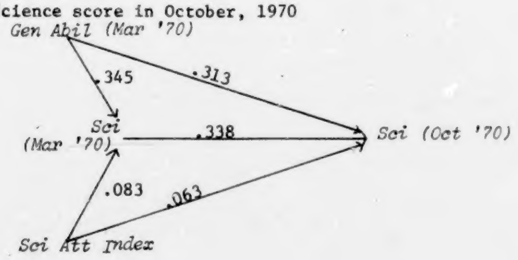

Gen Abil (Oct '72)
.262
.344
Math (Mar '72)
.196
Math (Oct '72)
.022
.042
Math Att Index

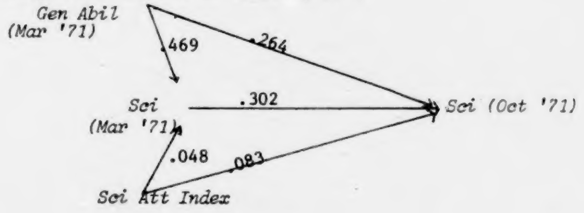
FIGURE III-4

Science Attitude Models: Cohort B

Predicting Science score in October, 1970


Gen Abil (Mar '70)
.345
.313
Sci (Mar '70)
.338
Sci (Oct '70)
.083
.063
Sci Att Index

Predicting Science score in October, 1971


Gen Abil (Mar '71)
.469
.264
Sci (Mar '71)
.302
Sci (Oct '71)
.048
.083
Sci Att Index

Predicting Science score in October, 1972

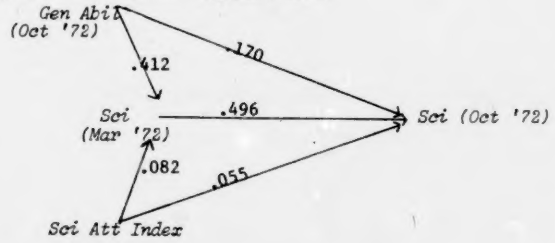
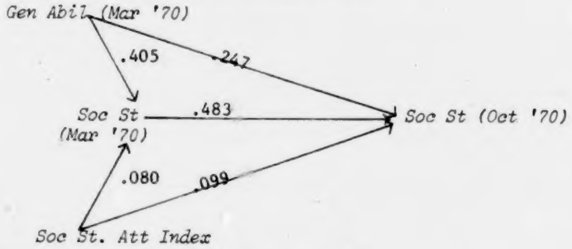

Gen Abil (Oct '72)
.412
.170
Sci (Mar '72)
.496
Sci (Oct '72)
.082
.055
Sci Att Index

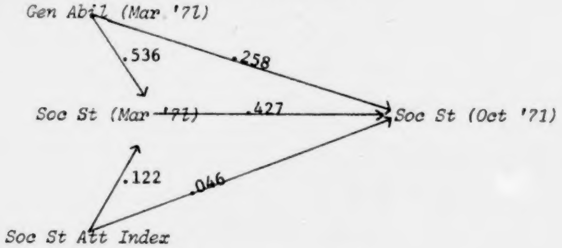
FIGURE III-5

Social Studies Models: Cohort B

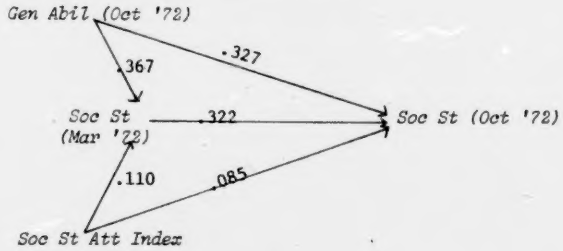
Predicting Social Studies score in October, 1970


Gen Abil (Mar '70)
.405
.247
Soc St (Mar '70)
.483
Soc St (Oct '70)
.080
.099
Soc St. Att Index

Predicting Social Studies score in October, 1971


Gen Abil (Mar '71)
.536
.258
Soc St (Mar '71)
.427
Soc St (Oct '71)
.122
.046
Soc St Att Index

Predicting Social Studies score in October, 1972


Gen Abil (Oct '72)
.367
.327
Soc St (Mar '72)
.322
Soc St (Oct '72)
.110
.085
Soc St Att Index

variables. The path coefficients for these particular models are identical to the regression coefficients estimated for the separate equations predicting beginning score from General Ability and subject attitude and end score from beginning score, General Ability and subject attitude.

The path coefficient of prime interest for this analysis was that associated with the arrow linking subject attitude and end of year score. Since the influence of beginning of year test score had already been eliminated, the attitude/end of year coefficient represents an estimate of the influence of attitude on gain in achievement during the year. Although at times the coefficients were not significantly different from zero, in all subjects and in all three grades the attitude/end of year score coefficients were positive. Assuming that the model was adequate (1), the coefficients testify to a small causal influence of liking a subject to achievement in it.

An attempt was made to add a fourth predictor variable, attitude toward the subject teleseries, to see whether it influenced achievement. There was no evidence of a relation.

The large coefficients relating General Ability scores to end of year achievement scores were noteworthy. There was little doubt that brighter children achieved better than their less able classmates. However, the absolute coefficients were probably inflated because the General Ability test was superior to the tests that measured the students' knowledge of particular subjects at the beginning of the year. As a result, the path of General Ability's influence on end of year score that went through beginning of year score was deflated in comparison to the path that goes directly from General Ability to the end of year score (see Wiley, D.A. and Hornik, R., in process).

Summary and Implications

The collection of learning data was supplemented by periodic surveys of students attitudes toward ITV, toward particular teleseries, and toward particular subject matters. Only students in ITV classes responded to questions in the first two categories while all students answered questions in the third category. The major findings are summarized below.

1. High initial enthusiasm for ITV declined as students progressed through Third Cycle, although a majority of students remained favorable toward ITV in every survey. When asked if they would prefer to do without one or more specific teleseries, few students said yes. However, at the last measurement wave, one-third of the eighth and ninth grade ITV students said they would like to eliminate the math teleseries.

2. Attitudes toward science and social studies were positive from both ITV and non-ITV students; Spanish and math were disliked by both subsamples, although math was particularly ill-regarded by ITV students. English was very well liked by ITV students and little liked by non-ITV students.

3. Disadvantaged children and children with low general ability were more favorably disposed towards the teleseries than their more advantaged peers. Only science was equally well liked by all strata of students.

4. Sex influenced the choice of favorite subject with boys leaning

toward science, social studies and math, and girls toward English and Spanish.

5. Choice of math, science, or social studies as a student's favorite subject positively influenced his gain on achievement tests in the subject.

The relationship of motivation and attitude to learning is a complex one. Most educators assume that without a strong desire to learn, students will become bored and absorb little in the classroom. In El Salvador, as in other developing countries, the strongest motivation to stay in school may well be extrinsic: the belief that a diploma is the best guarantee of eventually finding a good job. Salvadoran parents were certainly of this opinion (cf. Chapter IV). Yet, long range employment goals probably do not provide sufficient motivation for students, for school is a day-to-day affair. If what a student is studying is of little or no intrinsic interest, his ability to take advantage of his schooling is likely to diminish.

One of the attractive aspects of ITV is its potential as a motivator, and Salvadoran students were excited by its introduction in their classrooms. It was assumed, therefore, that such enthusiasm about the method of instruction would carry over to learning the content of the instruction. The investigation confirmed the motivating force of television, and it was quite possible that the higher achievement in seventh grade television classes was related to this enthusiasm.

However, the motivating role of television was not long lasting. Enthusiasm within each of the cohorts waned when the mere presence of

ITV ceased to be exciting. When the teleseries were alive and imaginative, they continued to motivate students. The positive regard of ITV students for English in contrast to the dislike for the subject among non-ITV students indicated that the initial attractiveness of television need not diminish over time. The continuing success of the English teleseries confirmed what many advocates of instructional television have suggested, that television can be particularly effective in carrying the instructional burden in subjects for which classroom teachers are ill-prepared. Subjects like music and foreign languages are often beyond the scope of the average classroom teacher and most developing countries cannot afford to hire specialists to teach them. ITV can fulfill a vital role in such subjects and one which can continue long after classroom teachers have stopped relying upon television in other subjects.

The enthusiasm of disadvantaged and less able students for the teleseries reflected several possible influences. As was mentioned above, instructional television was particularly exciting for poor students who had the least exposure to commercial television. These students were also concentrated in rural communities where schools often had the barest resources and the least prepared and experienced teaching staffs. As a result, television loomed larger for them than it did for their counterparts in richer urban schools. This finding was encouraging because as enrollment in Third Cycle increases and instructional television is extended to the primary level, a growing portion of its school audience will be poor children. ITV's potential as a motivator for this group will thus continue to be quite large.

No evidence was found linking students' attitudes toward ITV with learning. However, the lack of such a link may have resulted from the fact that the least able students were the most enthusiastic about ITV. When student attitudes toward specific subjects (as opposed to teleseries) were analyzed, a link with learning was established and while the influence of liking a subject on learning varied, its existence was consistently confirmed. Given that motivation does play a role in student learning, one priority for the producers of a teleseries should be to design programs that stimulate interest in particular subjects.

Footnote

(1) The reader should be aware of the methodological limitations of this type of analysis. He should know that any variable not included in the model is assumed to be unrelated to more than one variable included in it. Thus we assume that no variable (other than General Ability or beginning of year achievement scores)causes both subject attitude and end of year test score. Also we are assuming that the arrows represent the true causal order of the variables, that attitude predicts achievement and not vice versa. Since the attitude means were a composite of attitudes over four measurement waves (beginning and end of seventh and eighth grades), one may wonder whether good early achievement in a subject could have positively affected observed enthusiasm for the subject rather than the reverse. However, the fact that the attitude measures were still related to achievement in the ninth grade, which was subsequent to the measurement of the attitudes, supports the inference that attitudes influenced achievement.

Reference

Wiley, D.A., and Hornik, R.,"Measurement Error in Panel Models,"in process.

Chapter IV

Student Aspirations

An underlying premise of El Salvador's Educational Reform was that the nation's development required not only more educated people, but also people trained in the kinds of middle level administrative and technical skills that would permit industrialization to occur at an increasing rate. Salvadoran planners believed that their country's primary natural resource was people and that only through massive education and training would Salvadorans become competent workers in an increasingly sophisticated industrial economy. Accordingly, basic education was extended from six to nine years, and secondary education beyond the ninth grade was diversified and a new emphasis placed on technical training programs.

In the traditional system, secondary schooling had been reserved for privileged students bound for the university. However, under the Reform, the vast expansion in secondary school enrollments meant that university aspirations could no longer be fulfilled by most secondary school students. El Salvador was not willing to commit its most limited resources to a concomitant expansion of opportunities at the university level and, although new technical training programs were mounted at the advanced secondary level (Bachillerato), there would not even be sufficient room in these programs to absorb all the ninth grade graduates. Noting these changes in its second five-year plan, the

Ministry of Education arbitrarily set a 60 percent limit on the number of secondary school students who would be allowed to continue their education beyond the ninth grade (1). Implicit in these expansion and and diversification policies, therefore, was the expectation that students would have to change their traditional view of secondary school as a stepping stone to the university.

From the earliest research in El Salvador, it was discovered that secondary students held startingly high educational and occupational aspirations. In 1969, only 6 percent of the seventh graders surveyed planned to quit school after the ninth grade, 54 percent expected to finish an advanced secondary (Bachillerato or Carrera Corta) degree, and 40 percent had set their sights on the university. Because these students had enrolled in seventh grade before the great expansion, many could reasonably expect to fulfill their aspirations for more schooling. However, students who entered in subsequent years when enrollments swelled almost 300 percent were sure to be disappointed if they too maintained such high hopes for the future.

The evaluation team wished to determine whether or not the Ministry of Education's new conception of the ninth grade as a terminal point for most students would be accepted by students and reflected in a downward adjustment of their aspirations. This question was examined in three ways. First, data were gathered on the students' educational and occupational aspirations as they entered the seventh grade, and those aspirations were monitored during each cohort's Third Cycle career.

Second, the influence of various background variables and parental attitudes on those aspirations was analysed. Finally, in an attempt to go beyond the hypothetical aspirations that were expressed by students on survey questionnaires, the Reform's first group of ninth grade graduates were interviewed midway through the following year to see if their hopes and expectations had been fulfilled.

Students Aspirations over Four Years

Educational Aspirations

A battery of survey questions administered over six measurement waves and four years was used to gather data on students' educational aspirations. The repetition of identical questions over time allowed researchers to chart changes in students' aspirations as they passed through grades seven to nine. Although it was not possible to determine whether the aspirations represented realistic expectations or mere fantasies of the students, the responses did give a reliable picture of how far the students would like to go in school under ideal circumstances. Table IV-1 presents a summary of the aspiration levels of the three student cohorts at the beginning of seventh and the end of the ninth grade (end of the eighth grade in the case of Cohort C).

Looking first at Cohort A, we find that this group's educational aspirations rose dramatically over the three years. Students who wished only to finish the ninth grade diminished by about 9 percent, those wishing to finish advanced secondary studies declined by about 11

TABLE IV-1

Educational Aspirations for Cohorts A, B and C
for All Measurement Waves

(Percentages)

	Seventh Grade		Eighth Grade		Ninth Grade	
COHORT A: (N=902)	Begin	End	Begin	End	Begin	End
Finish 3rd Cycle:	10.7	4.1	5.2	4.9	2.2	2.2
Finish Secondary:	53.6	44.9	55.3	50.7	46.6	42.6
Finish University:	35.7	51.0	39.4	44.3	51.3	55.1
COHORT B: (N=707)						
Finish 3rd Cycle:	9.2	6.3	2.8	3.7	--	2.4
Finish Secondary:	52.6	47.9	43.3	38.2	--	43.9
Finish University:	38.1	45.8	53.0	58.1	--	53.6
COHORT C: (N=600)						
Finish 3rd Cycle:	9.6	6.9	--	6.6		
Finish Secondary:	45.7	46.3	--	45.3		
Finish University:	44.6	46.9	--	48.2		

percent, while the group of students wanting university studies increased by about 20 percent and, by the end of the ninth grade, included the majority of students in Cohort A. Cohort B students followed a similar pattern and finished ninth grade with proportions of students in the three aspiration levels almost identical to those of Cohort A.

Although Cohort C students came from poorer homes and from families where neither the mother or father had much formal education, their levels of educational aspiration were quite similar to those of Cohorts A and B. Yet, the changes in aspiration levels were less dramatic in this group, at least up to the end of eighth grade. Cohort C exhibited high educational aspirations at the beginning of seventh grade and maintained them through the eighth grade, while Cohorts A and B started lower but rose faster over the same period.

Occupational Aspirations

Over the four years of research students were continually asked to specify what careers they would like to pursue once they finished school. The results of this investigation are summarized in Table IV-2. Occupational choices were divided into three levels according to how much schooling would be required to qualify for different positions. The first level required little or no education, the second included certain skilled jobs or trades that customarily demanded some schooling beyond the Third Cycle, and the third level required some post-secondary or professional training.

TABLE IV-2

Occupational Aspirations for Cohorts A, B and C for All Measurement Waves

(Percentages)

	Seventh		Eighth		Ninth	
	Begin	End	Begin	End	Begin	End
COHORT A: (N=902)						
Level One:	6.8	2.6	2.3	2.2	2.3	1.8
Level Two:	59.4	55.1	60.1	56.9	52.7	54.0
Level Three:	33.8	42.3	37.6	40.9	45.0	44.2
COHORT B: (N=707)						
Level One:	2.5	2.6	1.7	2.0	--	5.9
Level Two:	62.5	56.9	53.3	50.9	--	54.2
Level Three:	35.0	40.5	45.0	47.1	--	39.9
COHORT C: (N=600)						
Level One:	3.4	2.6	—	4.5		
Level Two:	67.1	63.7	—	57.9		
Level Three:	29.5	33.7	--	37.6		

Not surprisingly, the general pattern of the students' occupational aspirations coincided with that of their educational aspirations. Where there was inconsistency, the data indicated that students desired more education than was generally required to qualify for a certain type of job. By and large, students increased their job aspirations during their Third Cycle careers. Comparing the final measures of each cohort, a somewhat lower level of occupational aspiration was found in each succeeding group. The fact that there was no corresponding decline in the pattern of educational aspirations of the three cohorts suggests that the students were quite realistic in their judgments, since in a scarce job market the educational requirements for all jobs would inevitably rise and it would therefore be wise to get as much school as possible before going to work, regardless of what level of job they aspired to.

Career Preferences

Over the four years of research, a stable picture emerged of the kinds of careers aspired to by Salvadoran students. Ten career choices accounted for about 75 percent of the students' preferences; the other 25 percent were spread over perhaps 20 to 30 jobs. The ten leading career selections, which were remarkably consistent for all three student cohorts and across six measurement waves were, at level two: accountant, commercial secretary, nurse, bachiller (advanced secondary school graduate), bilingual secretary, and agricultural technician. At level three, the favorite choices were: doctor, engineer, licenciado (university graduate), and lawyer. Occasionally, other choices appeared in the top ten, but these only accounted for a small percentage of the students.

Figure VI-1 presents a graphic view of the most popular choices for each student cohort at the end of eighth grade. They are arranged in a descending order of preference for Cohort A and illustrate some differences among the three cohorts. There were some noteworthy changes in popularity among the top ten career choices within the three cohorts. The careers of accountant and commercial secretary declined somewhat, while agricultural technician, doctor, engineer, and licensiado all rose. The remaining careers of nurse, lawyer, bachiller, and bilingual secretary held more or less steady.

Sex Differences in Educational and Occupational Aspirations

The difference between the levels of educational and occupational aspirations have been noted, with students generally opting for more schooling than would be considered necessary for the particular jobs they desired. A second important difference emerged when the aspiration levels of boys and girls were compared. As Table IV-3 illustrates, across the three cohorts from 7 percent to 17 percent more boys than girls sought university education the last time aspirations were measured. At that time, the majority of boys aspired to the university while most girls aimed at advanced secondary school programs.

There were also sharp differences in the level and kinds of career choices expressed by boys and girls. Table IV-4 summarizes the data for Cohorts A, B, and C. Girls aspired less to professional careers than

FIGURE IV-1. Top Ten Occupational Choices for Cohorts A, B, and C at end of eighth grade

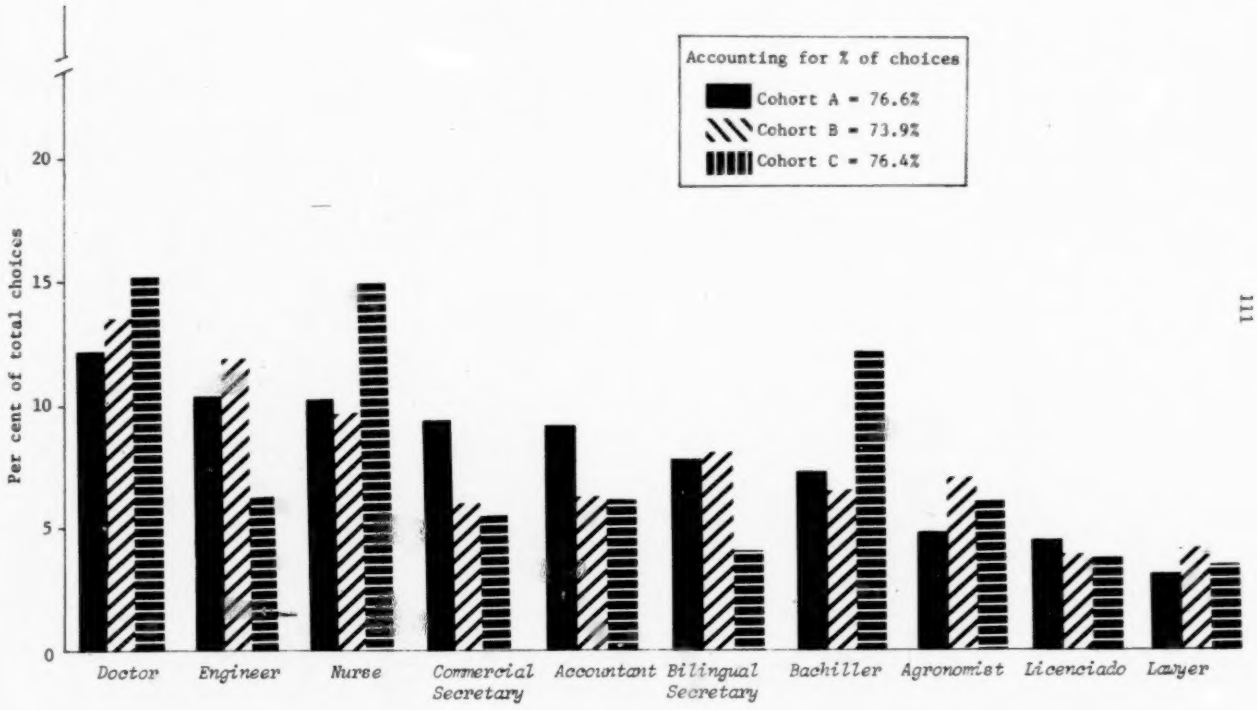


TABLE IV-3

Educational Aspiration by Sex for Cohorts A, B and C at the Beginning and End of Their Schooling (end 8th for C)

	Finish Third Cycle Only		Finish All of Secondary		University Studies or Post-Grad	
	Boys	Girls	Boys	Girls	Boys	Girls
COHORT A: (N=902)						
Begin 7th	12.7	7.1	43.5	65.1	42.8	26.9
End 8th	5.9	3.9	45.7	57.0	48.4	39.2
End 9th	2.8	1.6	34.3	52.6	62.8	45.8
COHORT B: (N=707)						
Begin 7th	11.5	5.5	49.9	56.6	38.4	38.0
End 8th	5.2	1.4	32.9	44.7	61.9	53.8
End 9th	2.3	1.3	40.9	48.9	56.7	49.8
COHORT C: (N=600)						
Begin 7th	13.1	5.5	42.9	49.6	44.0	44.9
End 8th	8.9	4.0	40.5	56.1	50.6	39.9

Gains over 2-3 years: University Ed.

Cohort A:	Boys:	+20.0
	Girls:	+19.1
Cohort B:	Boys:	+18.3
	Girls:	+11.8
Cohort C:	Boys:	+6.6
	Girls:	-5.0

TABLE IV-4

Occupation Choice Levels by Sex for Cohorts A, B and C
at the Beginning of Seventh and End of Ninth (Eighth for C)

	Level One		Level Two		Level Three	
COHORT A: (N=902)	Boys	Girls	Boys	Girls	Boys	Girls
Begin 7th:	6.7	0.9	58.5	83.0	34.4	16.0
End 9th	3.1	0.3	45.4	64.2	51.5	35.5
COHORT B: (N=707)						
Begin 7th	3.6	0.0	52.9	74.5	43.8	24.1
End 9th	4.4	1.4	49.4	64.1	46.2	34.5
COHORT C: (N=600)						
Begin 7th	6.2	0.0	52.5	83.1	41.3	16.9
End 8th	3.1	1.2	50.7	69.1	44.4	27.2

did boys but the gap narrowed somewhat over their three years of Third Cycle. By the end of ninth grade,51.1 percent of Cohort A boys chose professional careers as opposed to only 35.5 percent of girls. For Cohort B, the percentages were 45.1 and 33.2 respectively; and for Cohort C (end of eighth grade), 44.4 and 27.1.

A few careers were favored by both boys and girls, notably doctor, bachiller, licenciado, teacher, and accountant. Others were selected exclusively by one group or the other: nurse and secretary for girls; agronomist, mechanic, industrial technician, lawyer, and engineer for boys. The career preferences of girls were relatively few, with nursing the overwhelming first choice of all three cohorts. Boys expressed a much greater variety of career aspirations.

The large differences in the aspiration levels of Salvadoran boys and girls were not particularly surprising. Parallel sex differences with regard to learning were discussed in Chapter II of this report and the results were consistent with studies conducted on the secondary school systems of other developing countries. The sex differences in aspiration of secondary school students in all parts of the world reflect deeply rooted cultural attitudes and values. These attitudes and values affect not only achievement, but also how boys and girls form career goals and appraise different job opportunities. The following sections will examine these factors in more detail and discuss how much they influenced aspirations in El Salvador.

The Formation of Student Aspirations

Within the pattern of high educational and occupational aspiration there was considerable variation among students. In order to identify the sources of this variation and to determine which students would be likely to seek university degrees and which would be satisfied with alternative academic programs, the relation of aspirations to various background variables and parental attitudes was examined.

As in Chapter III, six control or student background variables were defined: sex, age, father's education, wealth, urbanization, and general ability. For aspiration, a three-point index was created out of the students' responses to questions on educational and occupational aspiration: "2" was assigned to students who aspired to both university studies and a professional career; "1" was assigned to students who aspired either to the university or to an occupation requiring university training but not to both (in the large majority of cases, students who were assigned to this category had university level educational aspiration but lower occupational aspiration); and "0" was assigned to students who had middle or low range aspirations for both education and career.

Within each cohort and across all measurement waves, the relationships between the aspiration index and the control variables were consistent. Boys held higher aspirations than girls. Also, as Table IV-5 illustrates children of well educated parents, children from urban, wealthier homes and children who entered seventh grade at a

TABLE IV-5

Correlations: Aspirations Index x Control Variables, All Cohorts

	Cohort A N=902		Cohort B N=707		Cohort C N=600	
	Aspiration Beg. 7th	Aspiration End 9th	Aspiration Beg. 7th	Aspiration End 9th	Aspiration Beg. 7th	Aspiration End 8th
Fath. ed.	.20	.21	.26	.25	.22	.34
Wealth	.24	.22	.23	.28	.33	.35
Age	-.18	-.15	-.21	-.25	-.17	-.23
Urbanization*	.13	.21	.07	.20	.24	.31
Sex**	.21	.20	.11	.11	.15	.18
General Ability	.17	.18	.19	.27	.22	.27

*rural = 1, urban = 5

**female = 0, male = 1

younger age all expressed higher aspirations than their less advantaged companions. In addition, General Ability Test scores were positively related to aspiration levels. However, that relationship was little higher than would have been expected given the strong relation of the other background variables with general ability. The other five background variables were significantly related to general ability; and Chapter II indicated that they were prior to and probably causal of general ability. A proper way of examining the effect of general ability on aspirations therefore was to estimate the amount of variance in aspiration accounted for by general ability over and above the variance accounted for by the five other variables. Table VI-6, presents an analysis of each cohort's aspiration scores as they entered seventh grade noting the amount of variance in those scores accounted for by background and general ability. As that table indicates General Ability predicted no more than 1 percent additional variance in aspiration for any of the three cohorts.

While each of the five control variables (excluding general ability) were significantly related to aspiration, together they did not explain very much of the variation in that variable. Referring again to Table VI-6, one finds that these variables explained no more than 16 percent of the variance, leaving 84 percent due to other influences (2).

When this analysis was extended to aspiration scores at the end of three years for Cohorts A and B and at the end of two years for Cohort C, there was an increment in predictive power of the five control variables only for Cohort C. Table IV-7 reports the variance in

TABLE IV-6

Variance in Aspiration Accounted for by Control Variables, All Cohorts, Beginning of Seventh Grade

	Cohort A N=703	Cohort B N=591	Cohort C N=462
Variance accounted for by 5 control variables (sex, age, fath. ed., wealth, urbanization)	.129	.117	.154
Variance accounted for by 5 control variables plus General Ability	.135	.122	.161

TABLE IV-7

Variance in Aspiration Accounted for by Control Variables, All Cohorts, End of Ninth Grade (Cohorts A and B), End of Eighth (Cohort C)

	Cohort A N=703	Cohort B N=591	Cohort C N=462
Variance accounted for by sex, age, fath. ed., wealth, and urbanization	.128	.147	.230

aspiration explained by the five control variables in the final surveys of each cohort. Even though 23 percent of the variation in the aspirations of Cohort C students could be explained by the five control variables, there was clearly a great deal more to the formation of aspiration than the interplay of these background factors.

However, the background factors do serve a useful function in helping to predict what the future aspirations of Salvadoran students are likely to be. Assuming that the causal process for the formation of aspiration will be unchanged in the future (e.g., that present influences will continue to have the same importance and that no new influences appear), the mean aspiration levels of future Third Cycle students can be estimated (3).

As the number of students in Third Cycle increases, the socioeconomic characteristics of the average student are likely to change quite radically. There was a clear decline in mean socioeconomic status from Cohort B to Cohort C. As more and more students finish primary school and are thus eligible to enter seventh grade, that trend should increase. From the data reported above, it was also known that students from lower socioeconomic strata held lower aspirations. Thus, it is reasonable to conclude that a higher proportion of future students will come from lower social strata and that they will have lower aspirations (4).

Parental Attitudes and Student Aspirations

A special study was conducted in 1970 to explore parental attitudes and their relation to student aspirations. A sample of 247 parents of eighth grade boys was interviewed. The parent sample was stratified by urban or rural residence, by son's presence in an ITV or non-ITV class, and by the aspiration levels of the sons.

Table IV-8 displays the levels of schooling Salvadoran parents desired for their sons and the levels the sons themselves aspired to at the beginning and end of the eighth grade. The parents' educational aspirations for their sons were strongly related to the demographic variables discussed earlier in this chapter. Seventy-five percent of the parents from the capital city of San Salvador wanted their sons to continue through the secondary or university level, while less than 40 percent of parents from the most rural areas held a similar preference. Mothers had generally lower aspirations than fathers. A majority of the mothers said they wanted their sons to study no more than a Carrera Corta (short commercial course available to ninth grade graduates); only 35 percent of the fathers said that a similar amount of schooling would be sufficient. When urbanization was controlled, the sex differences were qualified somewhat. As Table IV-9 illustrates, the aspirations of urban mothers fell between those of the urban and rural fathers, but rural mothers were heavily concentrated at the lower half of the scale. Less than 35 percent of rural mothers wanted their sons to study beyond a Carrera Corta. The high incidence of missing husbands

TABLE IV-8

Comparison of Parents' and Sons' Educational Aspirations

(Percentages)

	Finish 9th grade	Finish advanced secondary course	Finish university
Parents (Sept., '70) N=247	9	52	39
Sons (Mar., '70) N=247	9	39	43
Sons (Oct., '70) N=231	5	37	58

TABLE IV-9

Educational Aspirations of Parents for Sons By Sex, with Urbanization Levels Controlled

(Percentages)

	Finish PB	Finish CC	Finish Bach.	Finish Univ.
Urban men (N=74)	5	28	15	51
Urban women (N=67)	5	34	18	43
Rural men (N=46)	11	30	24	35
Rural women (N=59)	15	53	8	24

and the poverty of many rural families suggested that rural mothers were counting on their sons to become family breadwinners as soon as possible.

To gain a richer understanding of the rationale behind the parents' aspirations, they were asked to specify what advantages would accrue if their sons completed some advanced schooling. The number of different advantages the parents could give covaried to a significant degree with both the level of their own education and the education they wanted for their sons. Thus, 42 percent of the parents with no schooling and 57 percent of the parents at the lowest aspiration level could not name more than one advantage or reason why their sons should finish ninth grade. In contrast, over 45 percent of the well-educated parents and those who wanted their sons to reach the university were able to express three or more advantages.

Three underlying themes were extracted from the scores of different advantages Salvadoran parents associated with the amount of schooling they desired for their sons. Of prime importance to over 40 percent of the sample were the kinds of jobs a young man would qualify for by staying in school beyond the ninth grade. Tied to the aspirations of this group for advanced academic training -- Carrera Corta, Bachillerato, or university -- was the vision of a career which would guarantee their sons, and indirectly themselves, a more secure future.

A second theme was that of self-esteem. Parents who cited this "advantage" took note of the need for their sons to act independently and with self-confidence in their society. Educated persons, they felt, could not be taken advantage of in ordinary business affairs. The patriotic sentiment that educated people were of greater value to the nation was another frequently mentioned advantage related to this same theme.

The final theme, encompassing approximately a quarter of the responses, was that of "helping the family." To be sure, this theme was related to employment, but it also bore a directness and sincerity that deserves special mention. Parents who envisioned such an "advantage" emphasized the important role that an educated son would ultimately be expected to play in his family. In this sense, advanced schooling implied increased responsibility for the educated son. Parents who responded in this way were generally poor and from rural areas. To a great extent, they seemed to regard an educated son as an emissary who would eventually provide for other members of the family who had not enjoyed the same opportunities and good fortune.

When parents were asked what occupation they would most like to see their sons enter after completing school, 33 percent favored a professional career, 47 percent a middle level occupation, and 20 percent a low level job. Although these selections were somewhat lower than the ones the boys themselves had chosen (see Table IV-10), it was clear that the parents' preferences for their sons had not been unduly restrained by how they regarded their own situations.

Familiar variations according to sex and place of residence were echoed in the job preferences stated by the parents. Although a middle level career was the typical choice of respondents of both sexes and from each urbanization category, substantial differences were uncovered

TABLE IV-10

Levels of Job Aspirations of Salvadoran Parents and Their Sons

(Percentages)

	JOB LEVELS		
	Low	Middle	High
Parents (N=247)	20	47	33
Sons (N=247)	3	47	50

in the proportions choosing high and low level occupations. Forty percent of all male parents desired a professional career for their sons as against 27 percent of the female respondents. By coincidence, the exact same percentages also distinguished urban and rural respondents. As expected, rural women held the lowest aspirations for their sons -- more than 25 percent of this group mentioned a low level job as a first choice.

The five careers most frequently mentioned by the parents are listed in Table IV-1 , alongside the ones selected by their sons earlier in the same year. On the surface it would appear that there was considerable agreement between parents and sons, and that the two generations overlapped in their assessments of what are the most desirable occupations in El Salvador. To determine whether the overlapping choice patterns of parents and sons were coincidental or the result of personal interaction, the parents were asked if they knew their sons' job preferences and, if so, to state what they were. As a measure of the consistency between the generations, the actual choices of the boys were then cross-tabulated with the ones their parents attributed to them.

Sixty-eight percent of the parents said they knew what jobs their sons aspired to, and this proportion did not vary substantially when the groups were broken down by sex, urbanization, or SES. However, when the choices the boys had made at the beginning of the year were matched against the ones their parents had indicated, it was discovered that there was agreement in only one-quarter of the cases. The most probable

TABLE IV-11

Careers Most Frequently Selected by
Parents and Sons and the Proportions
of Respondents Who Mentioned Them

Parents	Sons
Accountant (26)	Engineer (19)
Doctor (10)	Accountant (13)
Engineer (8)	Doctor (12)
Agricultural technician (8)	Bachiller (10)
Mechanic (7)	Agricultural technician (8)

explanation for this was that the majority of parents were not really aware of their son's choices, but were reluctant to admit it. When asked to be specific, they therefore gave what amounted to a best guess of their sons' preferences. The contrasting levels of reported aspiration revealed that the parents' estimates may have been based largely on their own preferences.

With few exceptions, it was discovered that Salvadoran parents had little contact with or knowledge of their sons' schools, yet they placed a tremendous importance on education per se. Perhaps because of their own lack of experience in this area, the parents did not seem to have directly influenced the educational aspirations or expectations of their sons; rather, their influence had been indirect and tied closely to underlying variations in their own educational experiences, social class, sex, and place of residence.

The ability to obtain a steady, well-paying job was the sole justification for advanced schooling in the eyes of most Salvadoran parents. The positions they envisioned for their sons paralleled the choices the sons themselves had made, but there was little evidence that parents and sons had discussed this topic among themselves. Nevertheless, the occupational aspirations of both generations were concentrated largely on the careers which traditionally have promised social mobility and prestige.

The Follow-up of the First ITV Graduates

A reasonable critic might view the whole question of student aspirations with some skepticism. Were the aspirations expressed on a series of paper and pencil questionnaires true expectations, or were they just the fantasies of young people who knew full well that they would probably have to be satisfied with considerably less? An attempt was made to answer this question within the student questionnaires (see Appendix C). The students' second choice aspirations, were solicited, their willingness to leave school after the ninth grade for a good job was checked, and they were asked how sure they were that they would achieve their educational aspirations. The responses to such questions were ambiguous; some confirmed and some called into question the students' intentions.

Another method for assessing the validity of students' aspirations was to check up on the students after their graduation from the ninth grade. To this end, a sample of 400 Cohort A graduates was interview in 1972. The principal purposes of the follow-up study were to discover what had become of the first group of students under the Reform and to see whether their careers conformed to the career and educational aspirations they had expressed before graduation.

The answer for the great majority of students in the sample was that their educational aspirations were indeed being fulfilled. As Table VI-12 indicates, of the 392 graduates who were finally interviewed, 86 percent were continuing their education. Furthermore, there was

TABLE IV -12

Percentage of Graduates Involved in Different Activities

(N=392)

(N=336)	Studying	86%
(N=15)	Studying and working	4%
(N=16)	Only working	4%
(N=25)	Neither working nor studying	6%

virtually no difference between graduates of ITV and non-ITV classrooms in the percentage of graduates still in school.

Table IV-13 reveals that there was a slightly higher proportion of girls than boys continuing their education. However, when the "studying and working part-time" group was added to the "studying only" group, the proportions of boys and girls involved in some type of study activity was about equal.

About 50 percent of the graduates who were continuing with their education were enrolled in an academic Bachillerato , with a proportionately larger number of non-ITV graduates choosing this option (see Table IV-14). Thirty-two percent of the graduates continuing their education were studying commercial or business administration; eight percent were in the industrial Bachillerato; and about 10 percent were dispersed among the various new Bachilleratos (e.g., agriculture, fishing and navigation, hygiene and health, hotel and tourism, teacher training, fine arts, etc.).

Of the 336 graduates continuing their education, about half were able to enroll in a bachillerato in the same city or town where they finished their Third Cycle education, but the other 50 percent either had to commute to other cities and towns on a daily basis (26 percent) or had to establish their residences in new locations (24 percent). This trend suggested that conditions were set for a migration of Third Cycle graduates to the bigger towns and cities, further retarding the development of rural areas and intensifying the overcrowding of El Salvador's urban areas.

TABLE IV-13

Percentages of Male/Female Graduates Studying

(N=392)

	Boys (N=217)	N	Girls (N=175)	N
Studying	82%	178	90%	158
Studying and working	6%	12	2%	3
Only working	5%	11	3%	5
Neither working nor studying	7%	16	5%	9

TABLE IV-14

Distribution of Graduates Among Different Bachillerato Programs

(Percentages)

	Academic Program	Comm. or Bus. Administration	Industrial	Others	N
Total	50%	32%	8%	10%	336
Students who were in TV classes	43	37	9	12	209
Students from control classes	60	8	25	6	48
Students from Traditional classes	63	22	6	9	79

Table IV-15 presents a breakdown of the reasons the students gave for continuing their studies. They included the desire (1) to undertake university studies; (2) to better their chances for a good job; (3) to improve their over-all knowledge; and/or (4) to earn a degree or title.

All the graduates in the sample (including those graduates who were "only working" or "Neither working nor studying") were asked about their future plans. As Table IV-16 indicates, the majority of the graduates planned to continue their studies on either a full-time or part-time basis; and of these, 88 percent opted for the bachillerato studies. Only nine percent indicated an interest in the subprofessional study programs. Whether or not students wished to attend the university, most indicated that they did not wish to forfeit the option of university studies in the future. Table IV-16 outlines the percentage breakdowns on the various work-study combinations the graduates cited.

It is not known, of course, how many of these students will actually finish their bachillerato studies and go on to the university. Longer range follow-up studies will be required to evaluate the graduates' future career paths. But there can be little doubt that the aspirations expressed by these students reflected genuine expectations and when it is recalled that 25 percent of the students had changed their residences so as to be able to attend bachillerato, it is hard to doubt the students' commitment to education. Yet, more than half of the ninth grade graduates still in school were enrolled in the traditional bachillerato programs leading to the university. This suggested that the young people were aspiring to high level administrative and

TABLE IV-15

Reasons Graduates Gave for Continuing Their Education

(Percentages)

1.	Aspirations for university studies	35%
2.	Better one's chances for a good job	32
3.	Improve one's general knowledge	27
4.	Obtain academic degree or title	21
5.	Better adapt to the changing times	11
6.	Secure prestige and status associated with education	10
7.	Better prepare oneself for the role of parenthood	9
8.	Earn more money	4

TABLE IV-16

Future Work/Study Plans Proposed by Graduates

(Percentages)

1. Continue with present Bachillerato studies full-time	68%
2. Begin first year of a Bachillerato program full-time	3
3. Look for part-time job and continue Bachillerato	17
4. Continue with a Carrera Corta program	4
5. Begin Carrera Corta program	2
6. Look for part-time job and continue Carrera Corta	3
7. Part-time or full-time work only	2

professional careers rather than to the middle-level technical and business programs toward which the Educational Reform had hoped to direct them.

It may also be that the large percentage of ninth grade graduates who were continuing their studies is an indication of how difficult it is for young people to find work in El Salvador. Of the 56 graduates who were not studying full-time almost half were unemployed. El Salvador may be in for trouble in the future if job opportunities cannot be found for ninth grade graduates and aspirations are transformed into increased frustration and social unrest.

Summary and Implications

In order to assess the career and educational aspirations of Salvadoran students under the Reform, comprehensive studies were conducted throughout the four years of research. Aspiration data were gathered on each student cohort as it entered the seventh grade and from time to time throughout each cohort's career in Third Cycle (grades 7-9). The relation of various background variables and parental attitudes to student aspirations were analyzed in some detail, and, in an attempt to get beyond the hypothetical aspirations that had been expressed by the students on various questionnaires, a follow-up study of the first group of ninth grade graduates was undertaken in the second semester following their graduation.

Unfortunately, it was not possible to determine whether the Reform produced great changes in student aspirations since there was no comparable baseline data from before 1969. Nevertheless, the data gathered in the four year period convey one clear warning: the aspirations of students for both education and jobs were so high as to present a real problem to Salvadoran planners in the immediate future.

1. Advanced schooling was clearly regarded by students as the key to success in El Salvador. More than 90 percent of the students surveyed in each of the three cohorts wished to continue their studies beyond the ninth grade, and approximately 50 percent hoped to obtain a university degree. In the first two student cohorts, the desire for advanced studies increased over time; in the third and last cohort, a high level

of educational aspiration was expressed at the beginning of seventh grade and retained throughout the last two years of research.

Given El Salvador's high level of unemployment and the shortage of well paying jobs at the middle level, it was understandable that so many students aspired to university careers. They apparently recognized that the best jobs would be awarded to university graduates, and that a good job was the best guarantee of social prestige and mobility in the years ahead. To this extent, their educational aspirations must be considered realistic. These same aspirations must be considered unrealistic, however, in terms of the students' actual chances for fulfilling them. The probability of students continuing through the university will actually be reduced if enrollment projections are eventually realized.

2. How far the students said they wanted to go in school and how confident they were of getting there varied according to socioeconomic status, place of residence, and general ability, although general ability did not appear to exert as much influence as other factors. Boys from the higher social strata who lived in an urban area were the most desirous of pursuing a university career.

3. The students' occupational aspirations were more closely tied to their origins than their educational aspirations, with Cohort C students exhibiting somewhat lower job aspirations than the other two cohorts, but the desire for professional employment was high among all but the most rural students. It was clear that the status of different jobs was of great importance to the students, and job status was apparently determined by traditional values and by the academic degrees customarily

required to qualify for different positions. The consistency between the students' educational and occupational aspirations indicated that the students had not made random responses, but had probably given some prior thought to their choices.

4. A sample of Salvadoran parents interviewed in 1970 expressed generally lower educational and occupational aspirations for their sons than the sons had for themselves. There was considerable variation among the parents, however, according to sex, urbanization, and SES. Urban fathers who had some schooling beyond the primary level held the highest aspirations for their sons, while rural mothers, who rarely had completed more than one or two years of school expressed the lowest aspirations.

The parents placed great importance on education for their children, but their ability to provide guidance was limited by their own lack of schooling and their lack of knowledge of El Salvador's school system and the Educational Reform. Little evidence was found to suggest that parents had consciously attempted to mold their sons' aspirations. A large majority of the parents, in fact, said they would support whatever their sons decided to do, although their magnanimity was often tempered by an admission that it would be difficult for them to pay all the expenses that an advanced academic program would entail.

In contrast to the boys, who tended to justify their high aspirations in idealistic and often altruistic terms, the parents were practical in their thinking. Advanced schooling was necessary, most believed, because it would enable their sons to obtain good jobs.

Furthermore, earning potential would be increased and good salaries would allow the sons to assist other members of their families. Particularly attractive to the parents were middle-level, white-collar jobs.

5. A follow-up study of ninth grade graduates provided the first hard evidence on what happened to students schooled under the Reform. On the one hand, the findings were encouraging. Over 85 percent of the students were continuing their education and the Reform was to some extent achieving its objective of directing more students into the diversified technical career programs at the Bachillerato level. On the other hand, the results were discouraging. Half of those students continuing their education were enrolled in the most traditional of the Bachillerato programs leading to the university. This suggested that the young people were aiming for professional careers, rather than to the middle-level technical jobs the Educational Reform had hoped to fill.

Conditions were being set for a migration of Third Cycle graduates to the cities. The 50/50 percentage split between graduates who were able to continue their education in the same town where they finished ninth grade and graduates who were forced to commute to other towns and cities or to establish their residences in new locations illuminated a strong urban migration pattern. This may argue for a greater decentralization of schools away from urban areas in the future and/or the development of viable non-formal schooling alternatives in the various geographic localities of the country. The considerably higher proportion of graduates from the rural areas who were neither working nor studying and the lower proportion of rural students among full-time students underscores the inequality of educational opportunities for the rural student and also argues for the above alternatives.

The students' high educational aspirations and expectations were not surprising in a country where schooling is still regarded as a sure passport to success and social mobility. When access to higher education is limited, its value and attraction may become exaggerated. This seems to be what has occurred in El Salvador.

El Salvador's universities will not expand at the rate which would be necessary to satisfy the aspirations of today's Third Cycle students. With the plan to make nine grades of basic schooling available to all children, entrance to the prestigious Bachillerato level may also become more exclusive, despite the government's attempts to expand and diversify education at that level. It must be concluded, therefore, that the high educational aspirations of students are not realistic in terms of the tangible opportunities available to them in the near future.

If, as the evidence suggests, students are unrealistic in the assessment of their own chances for obtaining higher education and the most prestigious professional jobs, an important task of El Salvador's educational planners in the coming years will be to help students make the adjustment between their personal aspirations and the changing realities and needs of their society. Through their ambitious and far-reaching Educational Reform, the Salvadorans have expanded opportunity and improved the efficiency of their educational system, but they do not seem, as yet, to have encouraged young people to think about alternative forms of technical training and employment.

Footnotes

(1) ODEPOR, "Plan Quinquenal del Ramo Educacion, 1973-San Salvador, p. 21

(2) Estimates of explained variance carry with them the assumption that all variables were measured in a perfectly reliable fashion. This assumption is clearly untenable, for aspiration reliability was probably between .55 and .65. Since unreliability implies an underestimate of explained variance, the reported estimates could be 50 to 100 percent too small. Even if we assume such an error, however, approximately 70 percent of the variance would remain unexplained, still a large percentage.

(3) This may be a shaky set of assumptions. If more and more Salvadoran students are forced to leave school at the end of ninth grade, it is reasonable to expect that students entering seventh grade will take note of this trend and lower their aspirations accordingly. New information of this sort can not be taken into account since we have no estimate of what its effect is likely to be. An additional assumption of such forecasting is that the causal processes are essentially linear; that the change in the dependent variable resulting from a given increment in the independent variable will be the same no matter where in the range of the independent variable that increment occurs. For example, if we use a five-point urbanization scale, it is assumed that a change from 0 to 1 on that scale will have the same effect on aspirations as a change from 4 to 5. While that is a general assumption of all correlational analyses, it is particularly critical when one wishes to make predictions about populations whose characteristics may be quite different than the one for which the parameters were estimated.

(4) To estimate how much decline is likely to take place, a regression equation was used to predict Cohort C aspiration at the end of eighth grade from the five control variables estimated with unstandardized coefficients. Unstandardized coefficients simplified the generalization of the model implied by the equation to a population with different characteristics than that for which the equation was generated. That equation was quite similar to that for Cohort B aspiration at the end of eighth grade with the same five variables, which gives us confidence that the same causal processes were operating for both cohorts, despite some sharp differences in average socioeconomic makeup.

Once the equation was available, hypothetical estimates were made of the characteristics of future Third Cycle populations on each of the five independent variables. While there was no way of knowing precisely what future students' characteristics will be, some educated guesses could be made. In Table IV-17 the first column displays the unstandardized coefficients for each of the variables in the regression equation. The second and third columns display the observed sample means for Cohorts B and C on the five independent variables and aspiration at the end of Eighth Grade. Column four represents

TABLE IV-17

Prediction of Aspirations of Future Student Cohorts

	Coefficient from Cohort C equation	Observed mean Cohort B	Observed mean Cohort C	Hypothetical Sample as distant from C as C is from B	Hypothetical sample lowest limits of SES
Sex (% male)	.32131	55.98	52.7%	49.42	49.42*
Fath. Ed. (1=Part primary) (2=All primary)	.11119	2.0444	1.839	1.6336	1.25
Age	-.04424	13.616	13.8217	14.221	14.221
Wealth (% TV ownership)	.336	49.93%	41.95%	33.97	30.00
Urban (1=Rural 5=City)	.09857	2.2447	2.0556	1.8675	1.800
Intercept	.744				
ASP (end of 8th)		1.1669*	.8624*	.7599**	.6999**
% University		58%	43%	38%	35%
% Non-University (almost always high school)		42%	57%	62%	65%

*observed

**estimated mean, given Cohort C coefficients and hypothetical means for t
control variables

hypothetical case #1; it is assumed that future students would be as different from Cohort C as Cohort C was from Cohort B. In column five, hypothetical case #2 is represented. The mean characteristics in case #2 are estimated lower limits; it was expected that the children in Third Cycle would never be less advantaged in background than is represented in those figures.

Given those characteristics, and the equation from Cohort C, we estimated likely future aspirations. If Cohort B had a mean aspiration of 1.17 on our three-point aspiration scale, and Cohort C a mean of .86, hypothetical Cohort 1 might have a mean of .76 and Cohort 2, a mean of .70. Those figures can be converted into the percentage who had educational and occupational aspirations at the university level, and the percentage who did not, by dividing those students who were inconsistent in aspiration 50/50 between university and non-university levels. The final two rows of Table IV-17 report those percentages. As a best guess, assuming a sharp decline in socioeconomic level of the seventh grade entrants in the next few years, future Third Cycle cohorts are still likely to include a substantial proportion expecting to go on to the university (35 percent) with almost all the rest expecting to finish an advanced secondary school program. As discussed in the final section of this chapter, those aspirations are very unlikely to be fulfilled.

Chapter V

The Community and Classroom Learning

There are characteristics of a classroom's learning environment which are shared by all its students. The influences of those characteristics are properly studied with respect to the classroom as a whole. This chapter will expand and reconsider some of the analyses made in Chapters II and III, using the classroom instead of the student as the sampling unit. First, various community and school variables will be described along with the survey instrument that was used to measure them. These variables will then be related to average student achievement and average backgrounds of students. As will be seen, all of these variables are closely related. The children from the highest socioeconomic strata attend the best equipped schools in the most urban and wealthiest communities and have the highest levels of achievement.

Recognizing that ITV is also shared by classrooms as units, the effects of instructional method on achievement will be explored to see if there is evidence confirming the conclusions of Chapter II that ITV gain on the cognitive tests was larger than non-ITV gain. Finally, the same attitude questions analysed in Chapter III will be reanalysed to determine the classroom influence on them.

The School and Community Survey

School and community data were gathered from public records and in interviews with school directors and community officials in the spring of 1971. Cognitive test and attitude data were taken exclusively from Cohort B. There were only 29 classrooms in that cohort; as a result, correlation coefficients based on the classroom as the sampling unit, were subject to large error. Nonetheless, the coefficients were so high that they justified certain interpretations and conclusions. However, the small sample did constrain sophisticated multivariate analyses.

Community Characteristics

For each of the communities in which a sample school was located, a range of information was collected. To increase its utility for analysis, the information was reduced to three scales. Educational availability was based on the opportunities in the community for continuing post-Third Cycle schooling. Graduates of 15 of the 29 schools could study either in Bachillerato (high school) or in a Carrera Corta (business course) without leaving home. Another eight schools were located in communities within daily commuting distance of both types of post Third Cycle education. However, graduates from six of the 29 schools who wished to continue their education needed to live away from home during the week.

Ease of access to a large city, the second community characteristic scale, was based on measures of the time needed to travel by bus to the nearest large city and to the capital city. As has been mentioned in other contexts, El Salvador is a very small country, and it has regular, if uncomfortable, bus service throughout the country. As it turned out, no community in the sample was further away than two hours from a large city, or three and one-half hours from the capital. Also there was at least one bus a day providing service to both places. Thus functional distance from the city does not approach that of the rural people of most other Latin American countries where traveling time to the capital city often is measured in days rather than in hours. Nonetheless, the access index proved to be an excellent predictor of other individual, school, and community characteristics.

The final scale measured the wealth of the community. Five variables, (presence of a bank, number of public telephones per thousand population, percentage of paved streets, number of newspapers sold per thousand, and the presence of a factory in the community employing more than 50 persons) were combined into a single scale (with weights determined by loadings on the principal factor of a factor analysis).

School Characteristics

Four other indices were constructed to represent the range of information about schools. The first, school size, reflected the number of students in Third Cycle (grades seven to nine) in the school. Eleven of the 29 schools had 500 or more students, nine had 200 or less, including four with fewer than 100 students.

Physical Condition of the school was the second index designed to measure school characteristics. It provided a general classification of the school's condition as bad, or good, or in between. (22 of the 29 schools were assigned to the in between category, four were in good condition, and three in bad condition.)

School Directors noted which of ten facilities their schools had: faculty library (10 schools had them,) student library (9), a special room for a library (12), a science laboratory (5), inside plumbing (28), space for recess (20), an open field for physical education (12), an auditorium (8), a telephone (16), or a mimeograph machine (27). A facilities Guttman scale was constructed from three of these, the presence of a faculty library, of a telephone and of a mimeograph machine.

Finally, an index reflecting the adequacy of teaching materials was constructed from responses to a general question on sufficiency of materials, and from two questions about specific types of materials which were lacking. The complete school and community survey questionaire is reproduced in Appendix C.

Student Characteristics

All of the student background variables used in the analysis of community and school effects were identical to the ones used in earlier chapters, with each class being assigned the mean score of all its students. For this study, wealth (mean TV ownership over the years of the study), father's education, mother's education, age, and percentage of repeaters in the classroom were included.

Average cognitive skill indices were constructed for each classroom for three different measurement times (the beginning of seventh grade, the beginning of eighth and the end of ninth.) The five tests (math, science, social studies, general ability and reading) given at each of those times were combined to form a single cognitive skills index. (Weights for each test in the index reflected their loadings on the principal factor of a factor analysis.)

Classroom means from the four general ITV attitude questions and the math, science and social studies teleseries attitude questions (see Chapter III for a full description) were used in the attitude sections of this chapter.

Community, School and Student Background and the Prediction of Learning

Recent North American educational research literature is replete with studies comparing the effect of student background with the effects of schooling on the learning process. Most testify to the large influence of background and the relatively small influence of schooling. How applicable were such findings to El Salvador?

Although the two classes of influences were not directly compared in Chapter II, it was indicated that both were present. Evidence was presented supporting the influence of six control variables (father's education, mother's education, sex, age, wealth and urbanization) on original scores on General Ability and Reading Tests, and the influence of two of them, sex and age, on change in those scores. At the same time, instructional condition (ITV versus non-ITV) was also shown to have influenced change on the test scores.

By focussing on the classroom rather than the individual student, this issue was examined from another perspective. It was desirable to apportion influence on cognitive skills among the three sets of predictor variables: community, school, and student background characteristics. However, all the indices of community, school and student characteristics were highly related, and the traditional approaches to the apportionment of influence would have been misleading. The urban communities with the best resources, also were the best equipped and largest schools, and drew their students from the highest socioeconomic strata. Rural schools, on the other hand, were at the other extreme on all the same variables. The correlations were thus very high among all the predictor variables (Table V-1). Some were over .70 and most were significant ($p<.05$) which, with only 29 classrooms in the sample, required a correlation larger than .31.

Overall, the set of correlations was remarkable. It testified both to the heterogeneity of the sample of schools, and to just how favored the advantaged children and schools were. A few striking examples will suffice. Family wealth, mother's education, and father's education each correlated with the three cognitive skills indices at .60 or above. Father's education correlated with this index calculated for the beginning of seventh grade at .77. Community resources and ease of access to the city correlated with the three cognitive indices at more

Intracorrelations* of Background Variables, School Variables,

Community Variables And Learning Variables
(N=29)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
1.	Father's Education														
2.	Mother's Education	.822													
3.	Age (in grade)	-.728	-.726												
4.	% Repeaters	-.633	-.644	.613											
5.	Wealth	.715	.729	-.792	-.363										
6.	School Size	.644	.488	-.724	-.538	.629									
7.	Physical Condition	.311	.364	-.584	-.257	.480	.475								
8.	Teaching Materials	.360	.367	-.309	-.447	.267	.183	.427							
9.	School Facilities	.393	.300	-.301	-.531	.168	.586	.254	.549						
10.	Educational Availability	.609	.499	-.633	-.385	.520	.708	.327	.111	.330					
11.	Access to the City	.443	.392	-.333	-.340	.530	.351	.474	.499	.220	.242				
12.	Community Resources	.773	.603	-.704	-.450	.739	.792	.407	.347	.355	.844	.530			
13.	Cognitive skills (7th Beg.)	.771	.694	-.580	-.441	.711	.434	.403	.262	.163	.397	.502	.577		
14.	Cognitive skills (8th Beg.)	.666	.584	-.626	-.418	.625	.505	.632	.323	.296	.469	.592	.587	.741	
15.	Cognitive skills (9th End)	.563	.624	-.683	-.436	.649	.454	.624	.336	.215	.304	.479	.477	.733	.803

*Correlations larger than .31 were significant at $p < .05$

than .50 in most instances. Physical condition of the school and size of the school correlated with the cognitive indices with coefficients never less than .40.

Also, the predictor variables correlated with one another. Community resources correlated .79 with school size and .77 with father's education. Mother's education, wealth, father's education and age formed a correlation matrix with every coefficient greater than .70. Availability of teaching materials correlated at .50 with ease of acces to the city, and -.45 with the percentage of repeaters in the classroom. (A negative correlation indicated that the schools with the least adequate teaching materials had the greatest percentage of repeaters in the classroom.)

To summarize the importance of all these variables in predicting cognitive skills, multiple correlation coefficients were calculated. The squares of these coefficients indicate what percentage of the variance in the cognitive skill indices could be predicted from the school, community, and background characteristics. It was found that 75 percent of variance in cognitive skills at the beginnings of the seventh and the eighth grades, and 66 percent of the variance in cognitive skills at the end of ninth grade could be predicted from the three variable categories.

Given the controversy surrounding the relative influence of school and background factors on the development of cognitive skills, it seemed desirable to examine this issue in El Salvador. Two constraints were encountered, however. As stated above, the high interrelations of the variables, and the small number of classrooms studied, did not permit the application of standard regression techniques to determine relative influence. Secondly, no teacher variables were included in the school survey that was conducted, and if any school variable has been shown to make a difference in U.S. schools, it is the teacher and, particularly, his verbal ability. Thus comparing school influences to background influences without some measure of teacher input can be reasonably challenged. Nonetheless, the data were suggestive and, understood in the light of these constraints, the issue was worth pursuing.

The average correlation between the three cognitive indices and subsets of each of the three sets of predictor variables (background, community and school) was examined (1). Over-all, the background variables were most important, followed by the school and community variables which were of about equal importance (Table V-2). American researchers, faced with similar findings, have often concluded that schooling investments are not justified since education is not able to overcome inequalities in social background. A similar conclusion may not be warranted for El Salvador. While it was true that children from the highest socio economic strata achieved better than their disadvantaged peers, it was also true that they attended schools where the largest investments in facilities had been made. Until equal or better facilities are supplied to the poorer children, it is difficult to say whether some redressing of existing achievement inequlities would result. However, there was impressive evidence that such a change is possible through investment in schooling. The next section of this

TABLE V-2

Average Correlations[*], Background, School and Community Variables with Cognitive Skills Indices

	Background Variables	School Variables	Community Variables
Cognitive Skills (7th Beg.)	.725	.366	.492
Cognitive Skills (8th Beg.)	.639	.487	.549
Cognitive Skills (9th End)	.652	.471	.420

[*] For the background, school and community variables, only those 3 scales (for each type of variable) with the highest correlations with each skills index were averaged.

chapter will explore the effects of the investment in ITV, which was not given only to the wealthy students.

Instructional Condition and the Cognitive Indices

Chapter II presented evidence for all three cohorts that being in an ITV classroom rather than a non-ITV classroom was positively related to gains on General Ability test scores over each cohort's Third Cycle career. However, there is some question as to whether the use of individual student scores rather than classroom means as units of analysis was not in error(2). This is a common error in educational research, but one it was possible to remedy. In the process, the Cohort B data confirmed the basic conclusion of Chapter II, namely that presence in an ITV classroom made a great deal of difference in learning.

As in the analysis reported in Chapter II, it was necessary to first eliminate the three ITV classrooms located in the capital city since there were no non-ITV classrooms there to balance them. The remaining 26 classrooms (15 with ITV, 11 without) were ranked according to their scores on the cognitive index at the beginning of seventh grade and on the same index at the end of ninth grade. The highest mean score of the two groups received rank 1, the second highest 2, and so on down the line to 26.

At the beginning of seventh grade, the ITV and non-ITV samples had virtually identical mean ranks of 13.5. By the end of three years, the situation had completely changed. The ITV mean rank at the end of ninth grade had risen to 10.1, while the non-ITV mean had fallen to 18.2. In other words, the ITV classrooms had far outperformed the non-ITV classrooms (3).

It should be recalled that given 15 ITV classrooms out of a total of 26 classrooms, the best mean rank the ITV classrooms could have achieved was 8.0, and that only if they had occupied ranks 1-15. Conversely, if the 11 non-ITV classrooms had occupied ranks 16-26 they would have reached their minimum mean rank of 21. Given these maximum and minimum levels, the amount of change in mean ranks that did occur was quite large (Table V-3).

From another perspective, out of 15 ITV classrooms, 11 moved up in rank between the beginning of seventh and the end of ninth. Of the 11 non-ITV classrooms, only 2 moved up in rank. Thus, when viewed from the perspective of the classroom, ITV's influence was even more impressive than it had appeared to be when the sampling unit was the individual student. In fact, there was no other community, school or background variables which had as strong a correlation (v=.45) with change in the cognitive index as did membership/non-membership in an ITV classroom.

Mean Classroom Atittitudes Toward ITV

Of the 29 classrooms in Cohort B, 18 used ITV (including those in the three capital city schools). Using these classrooms, the

TABLE V-3

Cognitive Skills and Method of Instruction

Cohort B, by Classroom
(N=26)

	Mean Ranks	
Cognitive Measures	ITV	No ITV
Cognitive Index (7th Beginning)	13.53	13.45
Cognitive Index (9th End)	10.07*	18.18*

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*difference sig. at ($p<.02$) on Mann Whitney U Test examination of student attitudes found in Chapter III was extended from its focus on the individual student to a focus on the classroom. In this way it was possible to explore the tendency for a classroom to form its attitudes as a unit and to elicit similar responses from all its members on related attitude questions.

To test whether classrooms had a tendency to form attitudes as a unit, a one-way analysis of variance was used on student attitude responses with the classrooms considered as the treatments. This enabled detection of differences among classroom means that were larger than would have been expected given average differences among students. The classrooms did exert a significant influence on most of the attitude questions. The responses to each of the four general ITV attitude questions were examined on two different occassions (the end of seventh and the end of eighth grade). Of the eight possible tests, seven had significant F ratios ($p<.05$) due to classroom effects. Attitudes toward the three teleseries, math, science and social studies, demonstrated a similar pattern. Of the six tests of classroom effect (two measurement times for each of three teleseries attitudes), four had F ratios indicating significant influence.

Given that classrooms did affect attitudes, it would be useful to know whether they affected the several attitude questions in similar ways. Table V-4 is a correlation matrix of the general attitudes (measured at the end of seventh and eighth grades) and the ITV teleseries attitudes (measured at the end of eighth and the end of ninth grades). Once again the sampling units were the 18 classrooms with ITV,

TABLE V-4

Correlation Matrix: ITV Attitudes, Cohort B, by Classroom
(N=18)

Attitude		Learn More		Can See TV Clearly		ITV is More Difficult		Teacher Prefers ITV		Favors Math		Favors Science		Favors Soc. St.	
	Date	10/70	10/71	10/70	10/71	10/70	10/71	10/70	10/71	10/70	0/71	10/70	10/71	10/70	10/71
Learn															
	10/70														
	10/71	.743													
See															
	10/70	.298	.114												
	10/71	.471	.556	.520											
Difficult															
	10/70	-.694	-.600	-.215	-.382										
	10/71	-.480	-.680	-.268	-.597	.5309									
Teacher															
	10/70	.847	.703	.399	.466	-.597	-.723								
	10/71	.753	.702	.298	.229	-.447	-.613	.808							
Math															
	10/71	.734	.654	.262	.132	-.503	-.540	.686	.832						
	10/72	.668	.357	.210	.175	-.180	-.230	.609	.683	.582					
Science															
	10/71	.543	.719	-.283	.168	-.371	-.469	.465	.532	.636	.400				
	10/72	.578	.516	.053	.353	-.249	-.327	.634	.476	.249	.684	.468			
Social Studies															
	10/71	.552	.435	.227	.160	-.326	-.424	.553	.488	.733	.496	.577	.309		
	10/72	.627	.340	.159	.090	-.066	-.006	.456	.546	.485	.872	.335	.673	.489	

and the correlations were based on the means of all the students in each classroom.

There can be little doubt that class response on one attitude was highly related to class response on the other attitudes. Of the seven attitudes considered, the only one which did not consistently correlate with all the other variables at .30 or greater was "One can see the teleclasses clearly."

Several of the correlations were especially informative. A class's belief that it could learn more with television correlated on all occassions at over .70 with its belief that teachers prefered to teach with ITV. Similarly, attitudes toward each of the teleseries were very closely related to class perceptions of teacher attitude toward television. None of the correlations were under .45. The correlations with math attitude were never below .60, and at end of eighth grade the attitude toward the math teleseries and perceived teacher's attitude toward ITV correlated at .83. Belief within a class that it would learn more with ITV was also closely related to attitudes toward individual teleseries.

It was also possible to expand the analysis of responses from single measurement times and consider whether a classroom which changed on one attitude changed on others as well. Evidence that attitudes were not only consistent but that they changed consistently would lend persuasive support to an hypothesis of true interrelatedness among attitudes.

As Table V-5 illustrates, changes in attitude between the end of eighth and the end of ninth grade in each of the teleseries was shown to be closely related to changes during the same interval in attitude toward each of the other teleseries. These correlations, never less than .61, were striking.

Finally change in attitude toward each teleseries during the eighth grade year seems to have been affected by change in general attitudes toward ITV during the previous year. In Table V-5, it can be seen that change in perception of teacher ITV attitude and change in the class's own ITV attitude during the seventh grade, was positively related to change in attitude toward each of the teleseries in the following year. All the correlations were larger than .29, and three reached significance ($p<.03$) with correlations greater than .45. In all six cases these lagged correlations were larger than the correlations between change in general ITV attitude and change in particular ITV attitude during the eighth grade year. This led to an inference of causal direction from general attitude toward ITV to particular attitudes toward ITV subjects.

TABLE V-5

Correlations : Changes in ITV Attitude, Cohort B, ITV Classrooms
(N=18)

	Change in Math ITV Attitude		Change in Science ITV Attitude		Change in Soc. Stud. ITV Attitude		Change in Teacher ITV Attitude		Change in Learn More from ITV Attitude	
	3/71-10/71 (Math 34)	10/71-10/72 (Math 46)	3/71-10/71 (Sci. 34)	10/71-10/72 (Sci. 46)	3/71-10/71 (Soc. Stud. 34)	10/71-10/72 (Soc. Stud. 46)	3/70-10/70 (Teacher 12)	3/71-10/71 (Teacher 34)	3/70-10/70 (Learn 12)	3/71-10/71 (Learn 34)
Math 34										
Math 46										
Sci. 34										
Sci. 46		.720								
So. St. 34										
So. St. 46		.668		.610						
Teacher 12	.293		.367		.520					
Teacher 34	.189		.158		.193					
Learn 12	.461		.465		.317		.454			
Learn 34	-.076		.149		.146			.394		

Summary and Implications

Certain characteristics of a classroom's learning environment are inevitably shared by all its students. For this reason, the classrooms in which sample students were enrolled were treated as units of analysis to investigate how community resources, the average student background, characteristics in a classroom, and school facilities affected learning. Also, some influences on the formation of attitudes were investigated. Finally, a comparison by classrooms of the effects of ITV and non-ITV instruction was undertaken to supplement previously reported findings based on individual students. The major results of these analyses, all of which derived from Cohort B data, are summarized below.

1. Not only were the large urban schools found to have the best facilities and teaching mateirals, but they also enrolled students from the more advantaged social groups. Poorer students, who were the least able intellectually and financially to succeed in post-primary education, were enrolled in ill-equipped and often understaffed schools.

2. Learning was strongly predicted by student background variables such as family wealth and level of parents' education, and somewhat less strongly by school and community variables.

3. Eleven of fifteen ITV classrooms (75 percent) improved their rank on a composite learning index during their students' careers in Third Cycle, while only two out of eleven (18 percent) of the non-ITV classrooms did so. Presence in an ITV class was the best predictor of improvement on the learning index.

4. Individual student attitudes within a classroom were related to the average class attitudes, and a class' attitude toward one aspect of the ITV system was closely related to its attitudes toward other aspects of the system. Changes in attitudes toward specific teleseries during eighth and ninth grades were affected by changes in general attitudes toward ITV that had been expressed during the previous year.

Research studies from many countries have documented the important influence of social class and other background variables on student achievement in school. Some scholars have concluded that the influence of such variables is so strong as to undermine the effect of most educational reforms and innovations. They point out that such programs have rarely mediated the gap between advantaged and disadvantaged students, and they may even have widened such gaps because the innovations themselves tended to be narrowly confined to the most modern schools. However, while admitting that many educational investments in the past have not been evenly distributed and have not appreciably improved learning, educational decision-makers in most countries still adhere to the notion that investment in the right resources or reforms can make a profound difference in the learning of disadvantage students.

In El Salvador, students from privileged backgrounds were, indeed, found to be concentrated in the best equipped schools and the historical pattern of educational investment reflected the trends cited in the preceding paragraph. At the outset of the Educational Reform, therefore, El Salvador certainly ran the risk of increasing existing inequalities by promulgating new programs that might be adopted by only the best schools. Fortunately, however, the Educational Reform, and especially its ITV component, managed to escape from the tradition of unequal distribution of educational resources. Although the most experienced and best educated teachers continued to work in the richer urban schools, all schools received retrained teachers under the Reform and, as Chapter VI will point out in greater detail, the retraining courses may have had more effect on teaching quality than either previous teacher training or experience. Under the Reform, the revised curriculum and the new learning materials were also distributed throughout the school system. Of greatest importance, however, was the fact that by 1973 television was being used in all Third Cycle classrooms within reach of the broadcast signal.

As the learning results indicated, ITV introduced in the context of a national educational reform was more important than any other community or classroom variable in predicting student learning. Thus, in contrast to the rather pessimistic research results from other countries, El Salvador's investment in ITV and related reform programs did make a major difference in schooling outcomes.

100 8½ x 11

Footnotes

(1) Within each of the predictor variable categories, only three variables with the strongest correlations to learning at each measurement time were considered (e.g. beginning of seventh grade, beginning of eighth grade and end of ninth). The mean of the three highest correlations within each variable category was calculated. For example, among the five background variables (father's education, mother's education, age, wealth and percentage of repeaters), the three variables with the highest correlations with the cognitive index at the beginning of seventh grade were father's education (.77), mother's education (.69) and wealth (.71). The mean of those correlations was .725 and it was entered in Table V-2 as the correlation between background variables and cognitive skill at the beginning of seventh grade.

By comparing all such entries across the measurement times, the relative importance of the predictor variable categories could be seen, as well as the tendency of that importance to change over time.

(2) From the perspective of formal sampling theory, the unit was the classroom and not the individual student. Correspondingly, the unit of analysis should have been the classroom. Thus the significance of differences between particular estimates of learning should be tested with degrees of freedom reflecting the numbers of classrooms tested, not the numbers of students. And the variance of those estimates should be based on mean sampling unit (or classroom) performance and not on individual scores.

(3) Although there had been no significant difference between the mean ranks of ITV and non-ITV classes at the beginning of seventh grade, by the end of ninth grade the difference in mean rank according to the Mann Whitney U Test was significant at $p<.02$. (If the raw index scores had been used instead of class ranks, the ITV classrooms were significantly higher that the non-ITV classrooms with $p<.01$.)

Chapter VI

Teachers, Television, and Educational Reform

The leaders of El Salvador's Educational Reform wished to involve classroom teachers fully in the introduction of television and the Reform. Their role was to be a crucial one. Correspondingly, teachers were the focus of a major research effort. During 1969-1972, teachers attitudes toward ITV and the Reform, towards the problems of schooling and towards teaching as a profession were carefully traced. In addition, classroom teaching behavior was examined in two small studies. The surveys of classroom teacher attitudes were supplemented in 1969 and 1970 with surveys of teachers in retraining. These results are reported below.

The Teacher Retraining Program

Recognizing the key role of teachers, the Ministry of Education undertook an extensive teacher retraining program as a corollary to the adoption of television so that by 1973, more than 900 or virtually all of the Third Cycle teachers had been retrained for an entire academic year. During their courses teachers received advanced training in their field of specialization (either social studies and languages or math and science) as well as instruction in teaching methodology (including ITV utilization), guidance, and evaluation. The program provided full salary for all teachers in retraining as well as paid replacements for their classrooms. No other educational system has provided for such an extensive teacher preparation effort when introducing ITV.

The first teacher-retraining course prepared the teachers of the 32 pilot TV classes prior to the start of school in February, 1969. The three month summer course was supplemented by additional training in subsequent years. These teachers were generally enthusiastic about the Reform and ITV, and remained so during their first year in ITV classrooms.

During 1969, 250 additional teachers underwent a full years's version of the same training course. When they finished their course in November, they left the retraining center with positive attitudes toward the Reform and ITV, although their attitudes were not as positive as the pilot group's had been.

A third retraining course was organized at the end of 1969 for graduates of the "Superior Normal," El Salvador's prestigious secondary teacher training institution. This course ran for three months, and the group of teachers which was enrolled in it proved to be outspokenly hostile to the Educational Reform, to television, and particularly to the retraining course which they felt was a waste of their time. Their bitterness toward the Ministry remained throughout their training courses, and they eventually left San Andres with the same negative attitudes they had brought with them.

Classroom Teachers' Attitudes Toward The Use of Television

In 1969, teachers using television were highly positive toward it, both at the beginning of the year, and even more so at the end. Clearly this pilot group of ITV users were not at all disillusioned by their experience with it. Certainly they recognized that there were some problems, but their over-all feeling was that television helped the teacher.

In 1970 the second group of retrained teachers returned to the classroom as the Reform spread throughout seventh grade and with the 32 pilot classes into eighth. A survey of 190 classroom teachers in that year showed a disquieting pattern, especially after the enthusiastic results of the previous year. While still strongly favorable, classroom teachers were less positive toward television at the end of the second year than they had been at the end of the first.

The sharpest criticism concerned the amount of flexibility that ITV allowed. A majority of the respondents indicated that they felt tightly bound by the demands of the television schedule. Of course, this finding must be interpreted in light of the fact that 77 per cent of the same sample also agreed to the proposition that television helped teachers to improve the organization of their own classroom schedules. Despite the ambiguity in these responses, they suggested that the demands put on classroom teachers should be reviewed periodically and that when teachers discover they are unable to keep up with the rate at which new material is being presented, they should be able to communicate this fact immediately to program planners.

In order to gain a better understanding of the downward swing in teacher attitudes toward television in the project's second year, teacher data were analyzed along a number of important demographic variables: (1) whether a teacher taught in an urban or rural school, (2) whether he taught humanities or science, (3) his years of teaching experience with television and (4) his level of professional training.

Assignment to an urban or rural school did not appear to have affected attitudes toward television. The urban and rural subsamples were never more than 12 percentage points apart on any attitude statement and on 10 of the 14 statements they were within six percentage points of one another. It has often been hypothesized that ITV favors rural teachers (whose resources and experiences are felt to be relatively impoverished) at the expense of teachers from urban areas who presumably have greater access to learning aids and cultural stimuli and, therefore, have less need for television. Although there was some slight evidence of this phenomenon in the responses to attitude statements among the urban and rural groups, the differences between the two were not large enough to suggest a danger in this area.

When teacher attitudes were analyzed according to years of experience with television, it was no surprise to find that teachers from the original pilot group retained higher opinions toward television than their counterparts who entered the system in 1970. On 10 of 14 statements, the second-year group was more favorable. On only two statements -- "classroom teachers improve their teaching method by observing the television teacher" and "television helps parents become more interested in the education of their children"-- did the pilot group express markedly less positive attitudes toward television than it had the year before.

An exceedingly bitter teachers' strike overshadowed 1971 when ITV and the Reform were extended to the ninth grade. Also, tuition fees for Third Cycle students were eliminated in 1971, resulting in a sharp expansion in enrollments. The expansion created severe problems. Classrooms and teachers were in short supply. Most schools went on a double shift and, as a result, most teachers were asked to take on extra duties. Exacerbated by these conditions and feeling that their salary demands were being totally ignored, the powerful teachers union (ANDES) called a general strike on July 5, 1971.

The strike lasted about two months, during which time many schools did not function and those that did had considerably reduced attendance and instruction. Even after a settlement was reached, there was less than complete satisfaction and much of the teachers' hostility toward the Ministry was generalized to the Reform and to the speed with which it had been introduced. From the beginning of July until the end of the school year in November, therefore, the schools were disorganized. The situation persisted after the strike when many teachers had to be shifted from school to school because parents resented their role in the strike.

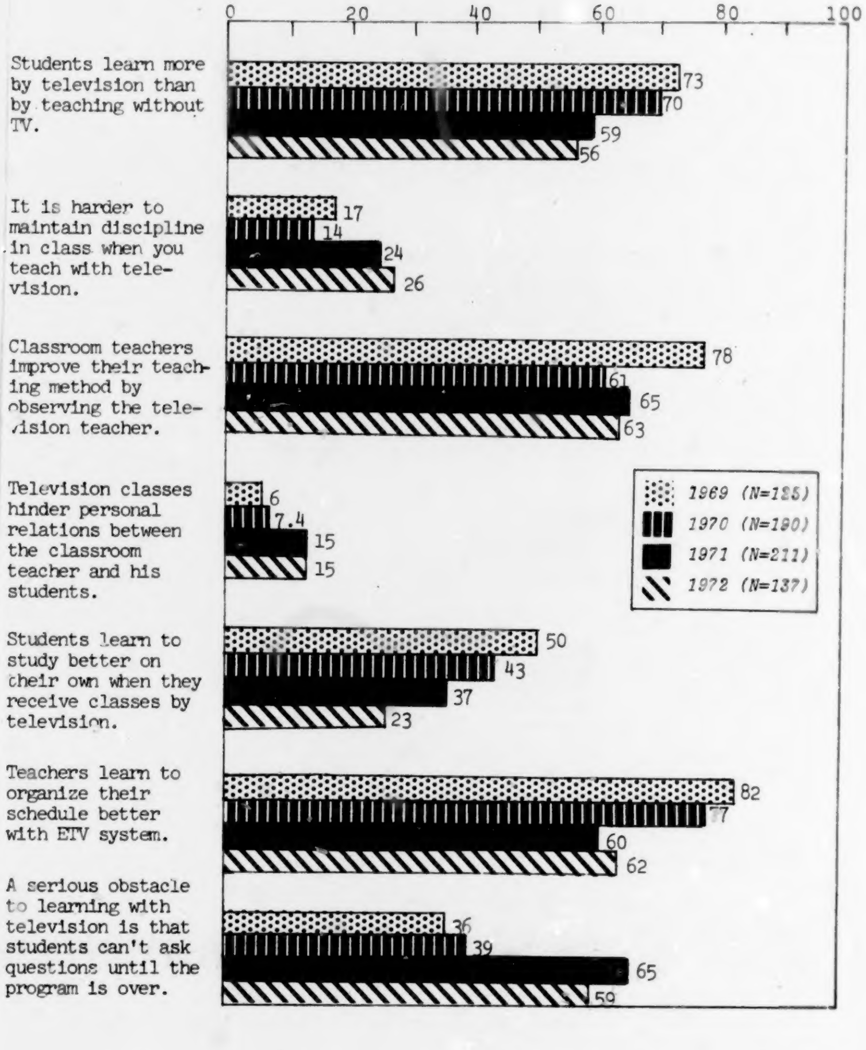
Teachers became much more critical toward the Educational Reform in 1971, and their attitudes toward the ITV system were sharply less favorable than in previous years. This was explained by most observers as generalized dissatisfaction and hostility lingering from the strike. Classroom teachers had argued that the money being put into television should be used to raise their salaries. In addition, there were salient school problems stemming from the economic situation of teachers and the conditions under which they taught.

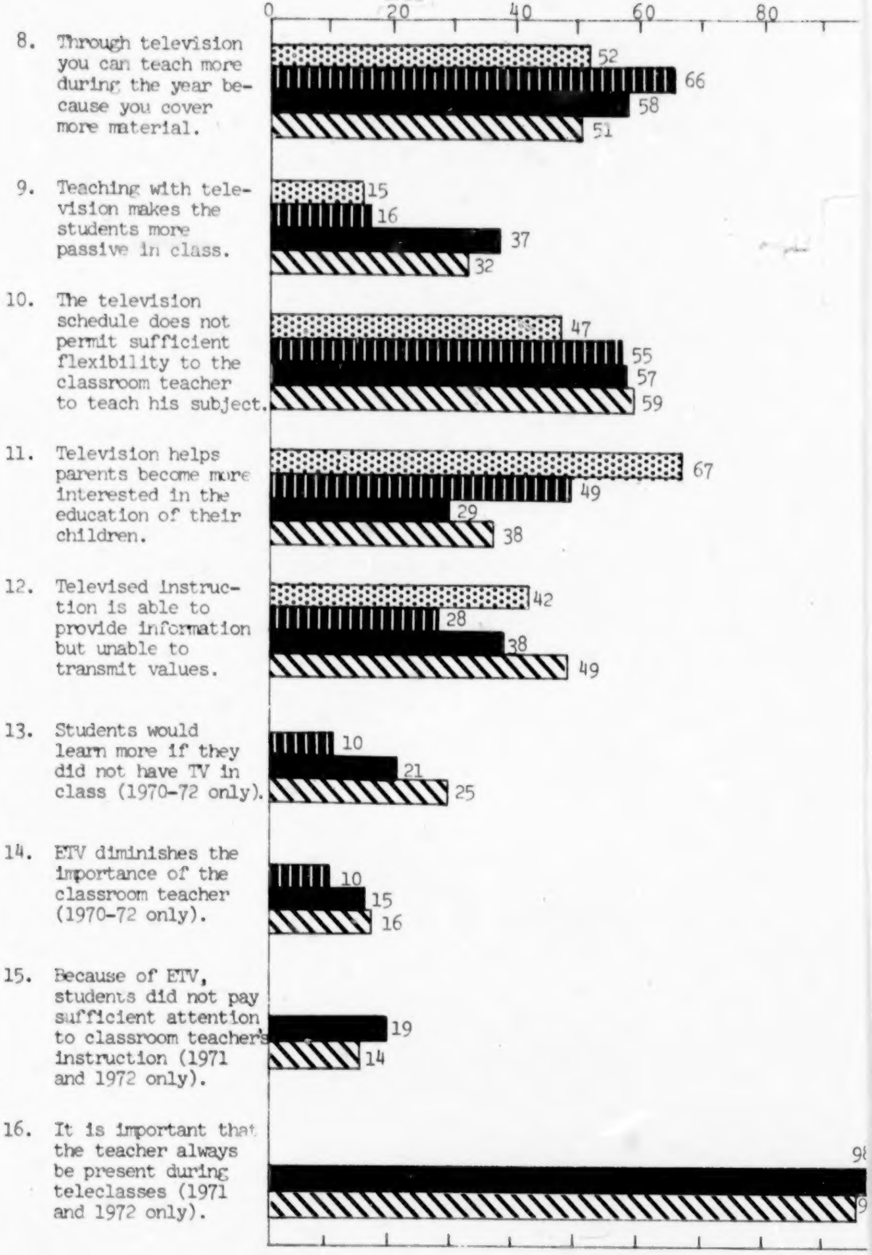
In view of 1971's disturbances, the measurements of teacher attitudes made in early November of 1972 at the end of the fourth year of research were awaited with more than usual interest. Would the teacher attitudes remain negative, or would they return to the levels of favorableness displayed before the strike in 1969 and 1970?

The results indicated that the old positive attitudes had not returned. Figure VI-1 summarizes what happened to teacher attitudes during four years. Over-all, teachers' attitudes in 1972 were about the same as they had been in 1971. Thus, during the four years of the Reform, teachers' attitudes became generally less favorable.

What the teachers said about television must be seen in perspective. They became progressively less inclined to believe that students learn more with television than without it (see the first response), but even in 1972 more than half of them still believed that students did learn more with television in the classroom. Sixty-three per cent of them still believed that classroom teachers improved their teaching by watching the teleteachers. Only 15 per cent believed that ITV got in the way of personal relations between a student and the classroom teacher. Teachers were less worried in 1972 than in 1971 about the possibility that television could make the student passive, or that it

FIGURE VI-1
Comparison of Classroom Teacher Attitudes Toward ETV:
1969, 1970, 1971, and 1972
Percentage Agreement with Statements about ETV




0
20
40
60
80
8. Through television you can teach more during the year because you cover more material.
52
66
58
51
9. Teaching with television makes the students more passive in class.
15
16
37
32
10. The television schedule does not permit sufficient flexibility to the classroom teacher to teach his subject.
47
55
57
59
11. Television helps parents become more interested in the education of their children.
67
49
29
38
12. Televised instruction is able to provide information but unable to transmit values.
42
28
38
49
13. Students would learn more if they did not have TV in class (1970-72 only).
10
21
25
14. ETV diminishes the importance of the classroom teacher (1970-72 only).
10
15
16
15. Because of ETV, students did not pay sufficient attention to classroom teacher's instruction (1971 and 1972 only).
19
14
16. It is important that the teacher always be present during teleclasses (1971 and 1972 only).
9

could diminish the importance of the classroom teacher, or that, because of ITV, students would pay too little attention to the classroom teachers' instructions.

Fewer teachers in 1972 than in 1969 believed that ITV helped teachers organize their schedules better, but 62 per cent of the teachers still believed that it did help them in that way. More teachers than in previous years believed that students would increase their learning if they did not have television in the classroom, but 75 per cent still did not believe that. In one respect the decline was steady and constant from the first year through the fourth; teachers seemed progressively to lose faith that students might learn to study better on their own because of television. On the other hand, the 1972 response to the statement that television helps a teacher cover more material was almost exactly the same as the 1969 response -- just over half the teachers agreed.

Four additional attitude statements were presented to teachers for the first time in 1972. These were the percentages of agreement;

	Agree
1. Instructional television damages students' eyes.	35%
2. The pedagogical quality of the teleclasses has improved this year.	57%
3. The supporting materials that the Ministry provides to the teachers are helpful in classroom work.	87%

4. The new focus on behavioral objectives in the guides and teleclasses helps the classroom teacher in better utilizing television. 83%

The last two responses were encouraging because the emphasis in the fourth year was on writing teacher guides and preparing teleclasses in terms of behavioral objectives. This change was undertaken by the TV production teams partly in response to criticism voiced against certain subjects in the previous broadcast year.

It was a bit disappointing that the old idea of television damaging students' eyes, so often denied by experts and never really supported by evidence, should be held by so many teachers. The same belief was held by more than half the students, however, and it was apparently widespread in El Salvador.

Attitudes Toward Teaching and the School

Along with teacher attitudes toward television, the research looked at their attitudes toward their jobs and their profession. These attitudes are reflected in the six following tables (VI-1 to VI-6), and it may prove useful to look at all these tables together and then talk about what they mean.

Obviously, these were not, for the most part, very happy teachers. In two years, the percentage of teachers who felt that "teaching is not a profession that gives much satisfaction" doubled (Table VI-1). Only 16 per cent felt that "teachers are highly respected in El Salvador."

TABLE VI-1

Teacher Agreement with Statements about Teaching and Education in El Salvador: 1970, 1971, 1972

	Classroom Teachers		
Statements	(1970) N=190	(1971) N=213	(1972) N=137
1. Teaching is not a profession that gives much satisfaction.	18%	27%	37%
2. All young people ought to have the opportunity to finish Plan Básico.	98%	97%	94%
3. The increase in enrollment decreases the quality of secondary education.	36%	55%	55%
4. The fundamental goal of education is the formation of a child's character.	71%	74%	58%
5. I would encourage my best students to become teachers.	20%	13%	20%
6. Only the best students should study beyond primary.	4%	8%	7%
7. Teachers are highly respected in El Salvador.	18%	13%	16%
8. The majority of Plan Básico students are not very interested in learning.	29%	33%	46%
9. I would stay in teaching even if I were offered a better paying job.	45%	33%	34%
10. Many students lack respect for their teachers.	48%	43%	65%
11. The most important goal of education is the development of reasoning ability.	68%	72%	54%
12. The great majority of students are motivated to take advantage of their education in Plan Básico.	71%	47%	34%
13. The Educational Reform is leading toward a high quality of education in the Plan Básico.	48%	53%	46%

TABLE VI-2

Teacher Agreement with Statements about Teaching and Education in El Salvador -- New Statements Presented for First Time in 1972 (N = 213)

Statements	Percentage of Teachers in Agreement
14. The new curricula of Third Cycle are focussed on the development of the type of student that El Salvador truly needs.	54%
15. The new curricula are of more help to the classroom teacher than the curricula of previous years.	77%
16. The idea of "oriented promotion" is a good innovation for the educational system of El Salvador.	30%
17. "Oriented promotion" in no way diminishes the quality of Salvadoran education.	36%
18. Teachers are sufficiently informed about what scholastic evaluation is, so as to be able to implement "oriented promotion" with their students.	24%
19. The implementation of "oriented promotion" in the classroom is being done by the teachers without any difficulty.	18%
20. "Oriented promotion" does not, in any way, diminish student interest in their studies.	19%

TABLE VI-3

Problems with Teaching and with the Educational System: Percentage of Classroom Teachers Saying that Problem Is "Very Serious"

		Percentage		
	Problem	1970	1971	1972
1.	The financial position of teachers	54%	55%	42%
2.	The poverty of students and their surroundings	45%	49%	44%
3.	Shortage of teachers with a "vocation for teaching"	34%	29%	35%
4.	Lack of teaching material	34%	43%	40%
5.	Lack of cooperation from parents	27%	32%	38%
6.	Too many students in class	26%	39%	44%
7.	The efficiency of the Ministry of Education	22%	27%	23%
8.	The method for assigning teachers to schools	21%	35%	31%
9.	The guides and workbooks do not arrive on time	14%	29%	28%
10.	Administration within the schools	11%	14%	13%
11.	Lack of supervision	10%	9%	15%
12.	Technical failures in the reception of the teleclasses	8%	15%	12%
13.	Student behavior	—	9%	18%

TABLE VI-4

Problems with Teaching and with the Educational System: Percentage of Classroom Teachers Saying that Problem is "Very Serious" -- New Questions Asked in 1972

Problem	Percentage Saying Problem is "Very Serious"
Lack of desks	50%
Lack of reference materials and learning aids for students	48%
Lack of sufficient communication between Ministry of Education and the teachers	37%
Conditions of the classrooms	26%
Lack of sufficient television receivers	25%
Lack of knowledge of techniques necessary for evaluating student performance	22%
Teleclass quality	12%
Content of student workbooks	9%

Asked at the end of this list of specific problems to name other serious problems, teachers listed these:

Lack of resources in the classroom	22%
Lack of coordination among various Ministry entities (e.g., ETV, Supervision, Normal School)	12%
Lack of specification of responsibilities of classroom and TV teachers	11%

TABLE VI-5

What Has Been the Principal Success of the Educational Reform?
Percentage of 137 Classroom Teachers Volunteering Each
of the Following Answers, in 1972

	Answer	Proportion of Teachers
1.	Improve the quality of teaching	22%
2.	There has been no success	13%
3.	More and better education	11%
4.	Socio-economic advantages for parents in the better education of their children	9%
5.	New curricula	7%
6.	Better coordination between the life of the children and what is taught in school	7%
7.	Retraining of the teachers	5%
8.	Reorganization of the educational system	4%
9.	Educational television	4%
10.	It is very early to evaluate its effectiveness	4%

TABLE VI-6

What Has Been the Principal Failure of the Educational Reform? Percentage of 137 Classroom Teachers Volunteering Each of the Following Answers, in 1972

Answer	Proportion of Teachers
1. Lack of communication between the Ministry and the classroom teacher	22%
2. Lack of coordination among the principal entities in the Ministry	15%
3. Oriented promotion and the new system of scholastic evaluation	13%
4. An inopportune time to have done the Reform	13%
5. Lack of training for educational personnel	12%
6. Lack of adequate teaching materials	4%
7. Political and ideological interference with teachers	4%

Only 20 per cent said they would encourage their best students to become teachers. Only one-third said they would stay in teaching if offered a better paying job.

On the other hand, teachers were quite positive about the basic ideas of the Educational Reform. Ninety-four per cent agreed that all young people ought to have the opportunity to finish Plan Basico (Third Cycle) which was the objective of extending universal free education through grade nine. They gave a vote of confidence to the new curricula (Table VI-2); 77 per cent said these were of more help to the classroom teacher than previous curricula. The majority of them believed that the revised curricula would be able to turn out the kind of student that El Salvador needs. The "principal success" of the Educational Reform, they said, was improvement in teaching (although half as many said that the Reform had no success). Thus, although their job satisfaction decreased in the course of the Reform, teachers were generally favorable toward ITV, the new curriculum, and the concept of universal education through the ninth grade.

The problems the teachers listed as "very serious" (Tables VI-3, VI-4) were illuminating. In the first three years, the financial position of teachers was the problem listed most often. It was still high on the list in 1972 (42 per cent call it very serious), but no longer the number one problem. The most serious problems in 1972 were the lack of desks (50 per cent), the lack of reference materials (48 per cent), too many students in class (44 per cent), and the poverty of students and their surroundings (44 per cent), and just below those, the lack of teaching material (40 per cent).

Two of the general attitude responses fit closely with the list of chief problems (Table VI-1). A steadily increasing percentage of teachers agreed with the statement that "the majority of Plan Basico or Third Cycle students are not very interested in learning" (29 percent in 1970, 33 percent in 1971, 36 percent in 1972). A steadily decreasing percentage of teachers agreed with the statement that "the great majority of students are motivated to take advantage of their education in Plan Basico" (71 percent in 1970, 47 percent in 1971, 34 percent in 1972).

It seems, therefore, that despite the classroom teachers' strong belief in universal education through Third Cycle, they were feeling the pinch of the special requirements made on them by the great increases in enrollment. Most schools were on two shifts; many classes had more than 50 students. Consequently, there was often a shortage of desks and of study and reference materials. Students in very large classes, scantily equipped with desks and books, taught by weary teachers who were responsible for two shifts a day, were not likely to be highly motivated to study hard. Thus, the problems of coping with greatly increased enrollments and longer working hours were the principal sources of teachers discouragement with their profession.

Another source of frustration may have been the new system of grading and promotion -- "oriented promotion" -- which was introduced widely in 1972 to replace the old practice of basing a student's passing or failing entirely on a single, crucial, teacher-made examination at the end of the school year. For the first time, teachers were asked to evaluate their pupils on performance throughout the year, and students were asked to keep up their studies throughout the year rather than merely cram for the final exmainations. The advantages of the new system of promotion and grading were that the evaluation would no longer depend on a single measure, and the number of repeaters and dropouts would be markedly reduced. The disadvantages from a teacher's point of view, were that many teachers did not feel confident of their ability to make such a continuing evaluation, and, secondly, that decreasing the importance of the examination did take away some of the students' motivation to study hard and to be attentive and respectful in class, inasmuch as they expected to pass anyway.

To sum up, the 1972 responses indicated clearly that problems other than the presence of instructional television or the basic ideas of the Reform were behind the teachers' depressed attitudes. There was the old problem of salaries. There was the problem of swelling enrollments, requiring teachers to work with overcrowded classrooms and to teach two complete shifts of school each day. There was general misunderstanding of the part played by the classroom teacher in the new system of grading and promotion and a sense of being inadequately prepared to use it well. The new system was seen as threatening to the teacher's status in the classroom. And, along with all these complaints, were the long standing difficulties with poor administration (represented by comments about lack of communication with the Ministry), lack of coordination, late arrival or shortage of materials, unjust methods of assigning teachers to schools, and so forth (Table VI-6). Obviously, there were multiple causes for the discouragement reflected in the teachers' responses.

Teacher Ratings of the Televised Courses

For three years teachers were asked to rate the teleclasses on a series of scales designed to record their estimates of the quality and effectiveness of each course. The results appear in Tables VI-7 and VI-8. In general, these tables tell a story of the decline and fall of televised mathematics, which began as the most highly rated course in the seventh grade in 1970 and the second most highly rated in the eighth, but in 1972 was firmly at the bottom of the list in all three grades. The top courses came to be Spanish and social studies.

In 1972, teachers also were asked, with reference to each course, whether they would prefer to have television in all periods, in the same number of periods (usually three per week), or in fewer periods (Table VI-9). In a sense this was a more reliable judgment than quality ratings because it represented their estimate of the usefulness of each course.

More teachers wanted English telecasts than any other subject in all periods (Table VI-9). Teachers probably felt the need of an expert English speaker to help them with the drill. About half of them voted for English in all periods, as compared to one out of three who wanted social studies and science in all periods and one out of five who wanted Spanish every day. But the interesting feature of this table is that very few wanted to reduce the amount of television. Even in mathematics, three-fourths of all the teachers wanted it continued with at least the same number of teleclasses. Ninety-one per cent gave the

TABLE VI-7

Classroom Teachers' Ratings of the Teleseries: average ratings of each course across criteria, on a scale of 20 to 100, for 1970, 1971, 1972

		Average Ratings					
Subject	Grade	1970	N	1971	N	1972	N
Mathematics	7th	83	21	77	26	66	18
Science	7th	76	21	70	24	70	16
Social Studies	7th	83	20	76	25	75	17
English	7th	80	18	85	21	80	15
Spanish	7th	83	20	76	23	74	18
Mathematics	8th	78	21	74	18	67	18
Science	8th	73	23	74	20	69	17
Social Studies	8th	73	22	74	18	72	16
English	8th	81	21	74	20	75	18
Spanish	8th	77	24	78	17	75	17
Mathematics	9th			71	19	70	15
Science	9th			69	21	72	18
Social Studies	9th			73	23	82	16
English	9th			79	25	72	15
Spanish	9th			77	22	76	16

TABLE VI-8

Rank-order of Teachers' Rating of Different Teleseries, 1970, 1971, 1972

	1970	1971	1972
7th grade	Mathematics	English	English
	Social Studies	Mathematics	Social Studies
	Spanish	Social Studies	Spanish
	English	Spanish	Science
	Science	Science	Mathematics
8th grade	English	Spanish	English
	Mathematics	Mathematics	Spanish
	Spanish	Social Studies	Social Studies
	Social Studies	English	Science
	Science	Science	Mathematics
9th grade		English	Social Studies
		Spanish	Spanish
		Social Studies	English
		Mathematics	Science
		Science	Mathematics

TABLE VI-9

Classroom Teachers' Preferences as to Whether Courses Should Be Taught with More, Fewer, or the Same Number of Periods Devoted to Television, 1972

	All Periods with Television	Same Number as Now	All Periods Without Television
Mathematics	12%	62%	26%
Science	32%	63%	5%
Social Studies	33%	64%	3%
English	48%	47%	5%
Spanish	22%	69%	9%

(N=137, but not all expressed opinions on all courses) same vote of confidence to Spanish, 95 per cent or more to science, social studies, and English.

The Study of Teaching Styles and Classroom Interaction

Methods and Procedure of the Study

One of the special activities of the 1970 school year was the development and first application of an instrument by which to observe and measure what was happening to teaching methods and classroom interaction under the Educational Reform. Some standardized form for observing and evaluating teaching behavior was needed to demonstrate differences among teachers and the progress of individual teachers toward the adoption of modern teaching methods. It was decided to develop a new observation method based on C.E. Beeby's book, The Quality of Education in Developing Countries (1). Beeby's guiding hypothesis is that developing educational systems evolve through four stages, and that the level of general education and professional preparation of teachers is directly related to their stage of development. Thus, the education and training of teachers is a relatively important function in any program of educational change. Teachers in Beeby's First Stage ("Dame School") are poorly educated and have little training. When teachers have some professional training in their craft, they tend to move into Stage Two ("Formalism"), where they closely follow the official syllabus. When they are better educated and trained, they move into Stage Three ("Transition") and by Stage Four ("Meaning"), teachers are both well educated and highly trained.

Although the study was undertaken to develop and validate an observation form, a number of important differences between New System (Reform and ITV) and Old System (pre-Reform) classrooms were uncovered. First, Old System teachers dictated six times as much as New System teachers, meaning that the average Old System teacher spent over 20 per cent of the observed class time reading from a book while students copied verbatim what was read. Second, New System teachers asked more than twice as many multiple choice or thought questions as Old System teachers. Third, several different types of learning aids were utilized in New System classes, while not one Old System teacher used any learning aids other than the blackboard. In addition, students volunteered their own opinions much more frequently in New System classes than in Old System ones. Finally, student work in groups was observed in several New System television classes, but it did not occur in non-television or Old System classes.

All 16 Salvadoran teachers observed were classified in Beeby's second stage. Yet, examination of the school records of all these teachers uncovered no significant correlations between their years of education and training and their classroom performance as measured by the observation instrument. Indeed, some of the Old System teachers had received more schooling and more advanced training than many of the New System teachers, yet the evidence indicated that New System teachers taught in a more modern way.

The one significant variable in New System teacher background was the year of retraining received under the Educational Reform. All New

System teachers in the sample had received this training, while the Old System teachers had not.

Why should a single year make such a difference? The Old System teachers apparently were not taught up-to-date methods of teaching in their teacher training schools nor were they taught much about specific subjects. Further, they were instructed in the "traditional" way in their own schooling, and teachers typically teach as they are taught. These results should not be interpreted as failing to confirm the Beeby hypothesis of the importance of general education and teacher-training in the modernization of teaching behavior. Rather, they suggest that if change is desired, providing additional training is not enough; teachers in training must also be exposed directly to the behaviors they are being asked to incorporate into their own classrooms.

The Educational Reform was clearly succeeding in introducing some techniques of modern pedagogy into the classrooms of El Salvador. In Beeby's terms, the results demonstrate the movement of Salvadoran schools from the Stage of Formalism (Stage Two) toward the Stage of Transition (Stage Three). However, the results also suggested that describing changes in teaching behavior in terms of four separate stages may not fully reflect the development process. The classrooms of El Salvador did not seem to be taking one giant step from Stage Two to Stage Three. While all 16 teachers observed were in Beeby's Second Stage, they were clearly at different levels within that stage. This suggested that development occurs within single stages as well as from one stage to another. Progress seems to occur in tiny steps, and it is slow and uneven. One example of this phenomenon was that certain aspects of modern pedagogy -- student discussion, students' asking of thought questions, teacher aid to individual students -- occurred only rarely in the observed classes. Other aspects of modern teaching -- the use of learning aids, the asking of thought questions by the teacher -- were employed, but less frequently than one would have hoped.

New System teachers seemed to be moving toward the non-rote, individualized, problem-solving learning that was the goal of the Educational Reform. Changes that were numerically small may, in fact, have been greater than the numbers suggest. For example, it seemed that, when compared to an Old System teacher who asked no thought questions, the New System teacher who posed even one such question per class had changed more significantly than the difference between "zero" and "one" suggests. Stimulating the adoption of a previously nonexistent behavior was probably much more difficult than increasing the employment of a behavior already in use.

The Observation Study of Two Classrooms

In 1972, efforts to understand local and individual effects of the Reform, which had begun in 1970 with the development of a classroom teacher observation form, were extended through a study of how the Reform actually looked in the classroom and what impact it was having on the individual lives of Salvadoran children. A detailed observational case study was made of two classrooms of seventh grade students and their teachers -- one in a rural, one in an urban setting -- who used instructional television for the first time during the 1972 school year. The study lasted a full school year, with the observer making daily visits to the schools and frequent visits to the communities and homes from which the students came. The results of this study have been reported in detail elsewhere (2) and are reviewed here only insofar as they relate to teachers.

Among the research instruments used for the study were direct teacher-student classroom observations, in-depth interviews, home visits, sociograms and written learning and attitudinal measures. Daily recording of classroom occurrences was maintained throughout the year. Although primarily concerned with student behavior, the observation study also highlighted instances of teacher inability to cope with student discipline as well as certain subject matters; inconsistency in the use of new and old teaching styles, and a tendency for some teachers to prefer to "go it alone" without television in their classes.

The study concluded that four years of the Reform had increased the confidence of classroom teachers and had made them increasingly demanding critics of the televised lessons. Also emerging from the study was an interesting pattern which suggested that two of three key elements in the ITV system -- teleteacher, classroom teacher, or subject matter -- had to be highly valued by students if they were to perform well in the classroom. In this context, the classroom teacher was seen as a vital force capable of either enhancing or undermining the effectiveness of televised instruction.

Summary and Implications

Under El Salvador's Educational Reform, a serious effort was made to retrain all Third Cycle teachers so that they could work effectively with the revised curriculum and the new ITV system. The research on teachers produced the following results:

1. From the perspective of research on teacher attitudes toward ITV, it became apparent that there was a decline from high levels of enthusiasm in 1969 to less positive attitudes in 1971 and 1972. Although attitudes remained genrally positive, teachers were more willing to be critical four years after the introduction of ITV.

2. Attitudes toward other aspects of a teacher's life also became more negative during the four years. In particular, teachers were not happy with their working conditions or their profession by 1972. Increases in enrollment, and corresponding increases in teaching loads, explain much of this dissatisfaction.

3. Teacher ratings of ITV series over the four years showed a changing pattern of preferences, mathematics declining for all three grades, Spanish and social studies improving. When asked how much televised instruction they wanted in the different subjects, 25 percent of math teachers and very few other teachers favored cutting television back. Most teachers wanted about the same as before (3 classes per week)and 50% of the English teachers wanted all classes with television.

4. A project was undertaken to develop and validate a form for observing classroom teaching behavior. Based on Beeby's theory of

development stages in teaching, the form permitted researchers and school supervisors to distinguish modern from traditional teaching behaviors. A sample of 16 teachers were observed and results showed that whereas years of formal training did not seem to affect classroom behavior, teachers retrained under the Reform exhibited more modern teaching techniques.

5. An intensive year long observation of two classrooms (one urban, one rural) concluded that teacher self-confidence had increased and that classroom teachers had become more demanding critics of televised instruction in the course of the Reform. Furthermore, the study revealed the important influence of teacher attitudes toward television on how children learned from the medium. The teacher studies indicate that while the various programs of the Reform functioned in concert to produce the changes occurring in El Salvador's classrooms, the program of teacher retraining was crucial to the success of ITV and to the introduction of some modern pedagogy into the Salvadoran school system.

These results permit some generalizations about El Salvadoran teachers and their reactions to television. The observational evidence indicates that Salvadoran teachers were in a "transitional" stage. They were beginning to rely less on lecturing or rote drill and more on student activity; they were asking more "thought" questions (that is, questions with more than one correct answer); and they were encouraging students to ask their own questions, state their own opinions, and work on individual projects. These characteristics were all observed frequently enough to suggest that El Salvador's classroom teachers are changing, but that they had far to go if the Reform's ambitious goals are to be achieved.

As for teachers' reactions to television, perhaps the best way to sum up the results would be to say that some of the "rosy glow" that ITV first cast over classroom teachers in 1969 had faded by the end of 1972. Nevertheless, both teacher and student attitudes remained predominantly favorable to the use of ITV and, despite disagreement with Ministry officials on the way some changes had been implemented, teachers were in accord with the basic ideas and philosophy of the Educational Reform.

Did the downward trend in teacher attitudes during the Reform's first four years belie the wisdom of spending so much time and money on their retraining? The answer to this question depends on how legitimate one considers the teachers' grievances. What may have accounted for the teachers' negative attitudes was not ITV or the Reform as such, but rather the poor working conditions (ever larger class sizes, grueling double sessions, lack of classroom materials) and low pay under which the teachers continued to labor. Given these conditions, it was not surprising that teachers were dissatisfied or that they occasionally went on strike.

The year's retraining unquestionably sharpened the teachers skills; it also may have raised their consciousness to the point where they were able to criticize ITV and the other reforms when the latter were not of sufficient quality or did not serve their purposes. In the final analysis, the teachers did not fear or resent ITV, but they did become increasingly aware of its shortcomings. Insofar as the teachers were critical of specific television series, their criticisms were often justified.

The results should also be seen as evidence that if teachers are expected to use modern methods in their daily teaching, they first must be instructed in those methods and allowed to practice them. The effectiveness of televised instruction in the classroom largely depends on the cooperation and resourcefulness of the classroom teacher. A less than ideal TV lesson can be made effective through good classroom utilization, just as the effects of a good television lesson can be weakened by poor classroom utilization. No one medium of instruction -- be it the classroom teacher or television -- can maintain a consistently high level of performance. Each has good and bad days but in combination, ITV and the classroom teacher can reinforce one other and collectively increase the quality of instruction.

Footnotes

(1) The thinking behind the development of an observation method is found in Research Memorandum No. 1 of this project, Measuring Educational Development Through Classroom Interaction, by Wilbur Schramm, September, 1969.

(2) Students, Teachers and Television: An Observation Study of Two Seventh Grade Classrooms, in El Salvador, Technical Research Report No. 13, July, 1973, by Yolanda Ingle. A summary is also included in Television and Educational Reform in El Salvador: Report on the Fourth Year of Research. May, 1973, by H.T. Ingle, Y. R. Ingle, R. C. Hornik, J. K. Mayo, E. G. McAnany, and W. Schramm.

Chapter VII

Efficiency and Costs of ITV and the Reform*

In Chapter II, it was reported that students in ITV classrooms improved 15-25 percent more on General Ability Tests than did their peers studying in classrooms without ITV. Standing alone, these gains were of limited importance. To understand their significance, it was necessary to specify the context in which they occurred.

The present chapter will examine the context in which the learning gains of different groups were achieved. The first section will detail the rapid expansion in enrollment that occurred in the Third Cycle of El Salvador's public schools. At the same time, aspects of system efficiency, focusing on promotion rates, will be described. In a brief section following that, we note the changing socioeconomic character of the students entering seventh grade in successive years and recall some of the data from Chapter II to see how these changes affected learning success. Finally, in the chapter's last section, the aggregate and unit costs of the [illegible] system are estimated and discussed.

In sum, the chapter reveals how the Third Cycle schools have expanded and suggests what the implications of this expansion are in terms of cost and the satisfaction of educational demand.

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* The cost analysis part of this chapter was written by Dr. Dean T. Jamison, Research Division, Educational Testing Service, Princeton, New Jersey.

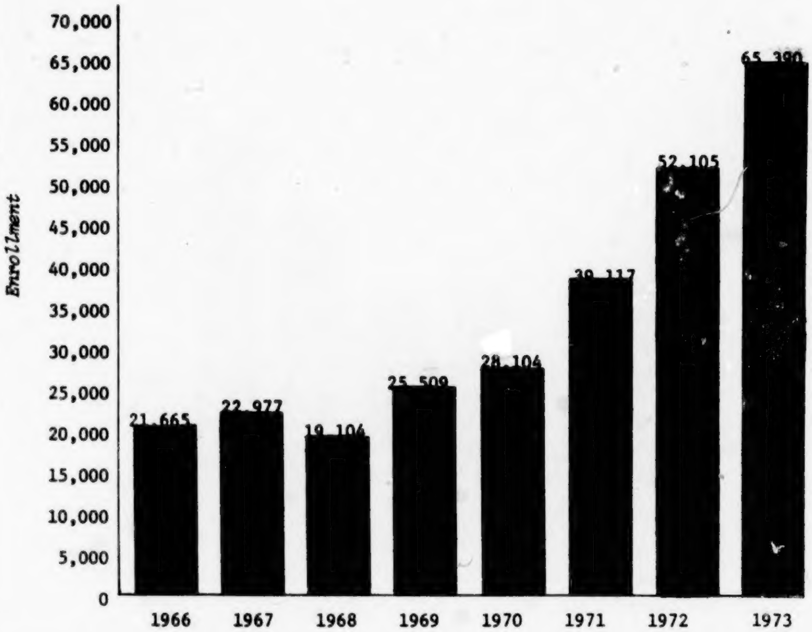
Quantitative Changes in the System 1968-1972

Expansion of Enrollment

In 1966, there were 21,665 students who registered for public seventh, eighth, and ninth grades in El Salvador. In 1971, tuition for those grades was eliminated and double sessions were begun, initiating dramatic increases in enrollment. By 1973, the registration at this level was three times the 1966 level, or 65,390 students. In Figure VII-1, the pattern of growth can be traced. Present projections estimate that there will be 90,000 students by 1977. At the same time, enrollment in private Third Cycle stayed the same or increased only slightly over the same years. In 1968, private schools enrolled 56 percent of all Third Cycle students; in 1973, they enrolled only 28 percent.

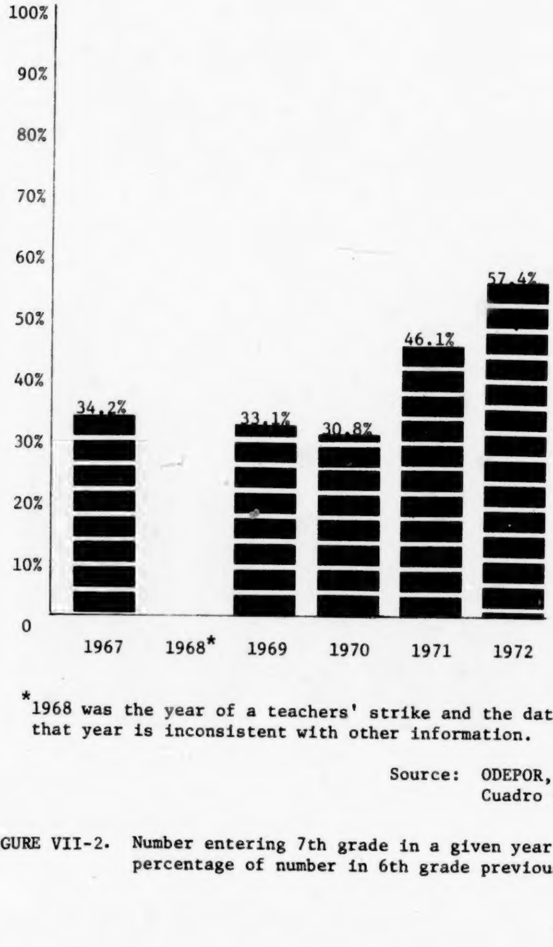
The planners of the Reform focused their energies on the Third Cycle (previously called Plan Basico) because they believed it to be a bottleneck in the school system. They suggested that nine grades of basic education was the minimum that El Salvador should provide its youth and they recognized that one roadblock to the achievement of that goal was the inability of the traditional Third Cycle to absorb large numbers of sixth grade graduates.

There can be little doubt that El Salvador has gone a long way to removing that seventh grade bottleneck. In Figure VII-2, a histogram displays the number of students who entered seventh grade in each year between 1967 and 1972 as a percentage of the students who had entered



Source: ODEPOR, Plan Quinquenal, Cuadro #2

FIGURE VII-1. Initial Matriculation, Public 7th, 8th, and 9th grades, 1966-1973



*1968 was the year of a teachers' strike and the data collected that year is inconsistent with other information.

Source: ODEPOR, Plan Quinquenal, Cuadro #2

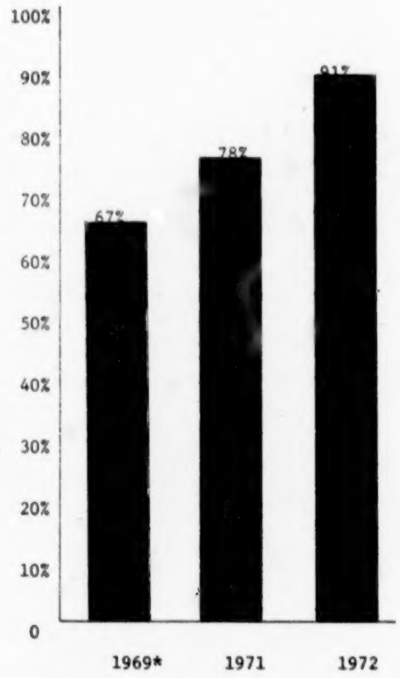
FIGURE VII-2. Number entering 7th grade in a given year as a percentage of number in 6th grade previous year, 1967-1972.

sixth grade in the previous year. From a low of 31 percent in 1970, the level increased to over 57 percent in 1972. 1973 figures have not yet been published, but they will surely reflect a further increase.

Efficiency of the System

Not only are there more students registering in Third Cycle each successive year, but they appear to be moving through the three years of the system with increasing efficiency. When successive cohorts entering seventh grade from 1966-1971 are examined, one finds that an increasing percentage of them made it through to ninth grade. Those percentages are reported in Figure VII-3. Of the number of students who entered seventh grade in 1967, 67 percent entered ninth grade two years later(1). Of the number who entered seventh grade in 1970, the first year that the Reform encompassed all students at that level, nearly 91 percent were in ninth grade in 1972. The 91 percent figure may be somewhat higher than the future pass through rate (only 85 percent of the 1971 seventh grade enterers were registered in eighth grade in 1972); nonetheless, there can be no doubt that there has been a sharp increase in system efficiency since the introduction of the Reform.

While one would like to say that the change was due solely to the increased quality of education under the Reform, there were alternative explanations which were also plausible. It may be that the large influx of teachers recruited from the ranks of former primary school instructors has meant a change in standards, with the new teachers promoting less qualified students. Also, while such pressure



*Since 1968 data was inadequate, we were unable to satisfactorily estimate 1968 and 1970 figures. A 1968 estimate required the number in 9th grade in that year; a 1970 estimate required 7th grade data from 1968.

Source: ODEPOR, Plan Quinquenal, Cuadro #2

FIGURE VII-3 . Number enrolling in 9th grade in a given year as a percentage of number enrolling in 7th grade two years previously was difficult to document, the Ministry may have let school directors and teachers know that it expected more students to pass through the system, with a resulting increase in promotion rates.

Whatever the reasons for the increased system efficiency before 1971, changes in that year in the promotion criteria insured that high pass through rates would continue. In 1971, the Ministry introduced a system called Oriented Promotion wherein students would automatically be promoted unless they were severely deficient in both attendance and performance.

The Changing Social Character of the Students in Third Cycle

Along with the great expansion in the numbers of students in Third Cycle came a change in the average social background of students. While the cohorts we studied were not random samples of the school populations, they did reflect the changes in those populations as the number of enrolled students grew. It will be recalled that Cohort C began seventh grade in 1971, when tuition was eliminated and double sessions began. While seventh grade had grown less than 3 percent between 1969 (the year Cohort A entered) and 1970 (Cohort B's first year), it increased by 58 percent between 1970 and 1971.

As a result, the socioeconomic differences between Cohorts B and C were noticeably greater than those between A and B. Twenty-nine percent of Cohort B had fathers who had more than a primary education, but only 22 percent of Cohort C had similarly educated fathers. Twenty percent of Cohort B mothers were reported to have post-primary schooling; less than 16 percent of Cohort C mothers had studied for that long. In October of 1971, 52 percent of Cohort B reported that their families owned televisions. On the same date, only 42 percent of Cohort C indicated that they had television in their homes.

It was also clear that the intellectual skills that Cohort C children brought to seventh grade were inferior to those possessed by Cohorts A and B when those children began Third Cycle. Table VII-1 (adapted from Table II-1) indicates the lower General Ability and Reading Test scores with which successive cohorts began seventh grade. These differences were related to the previously mentioned differences in average socioeconomic background of students and the poorer preparation they received in their primary grades.

It is clear, then, that El Salvador was successful not only in expanding the number of students who entered Third Cycle, but in providing increasing opportunity for less advantaged students to enter. However, one must also consider whether the increase in quantity and the change in social and intellectual background of new students meant a decrease in the quality of learning. As shown in Figure VII-4, successive cohorts did learn less on General Ability Tests. ITV students in Cohort B gained less than ITV students in Cohort A, and ITV students in Cohort C learned less than their counterparts in B. Comparing gain on General Ability between the beginning of eighth grade and the end of ninth grade, Cohort A ITV students gained 13.2 points while Cohort B ITV students gained only 11.9 points. Between the beginning of the seventh grade and the beginning of the eighth grade, Cohort B ITV students gained 12.8 points, while between the beginning of

TABLE VII-1

Basic Skills Test Scores: Beginning of 7th Grade

	Cohort A	Cohort B	Cohort C
General Ability	60*	58.9	53.4
Reading	40*	37.9	33.6

*As explained in footnote 1 to Chapter II, level 3 versions of the Interamerican series were administered to Cohort A at the beginning of seventh grade, but the more difficult level 4 versions to Cohorts B and C. Interpolating from Table 71, pg. 60, of the Technical Report prepared by Guidance Testing Associates, a level 3 score of 89.6 (actually achieved by Cohort A) on the General Ability Test is equivalent to a score of 60 on the level 4 test. Similarly, Cohort A's score of 65 on the level 3 Reading Test is approximately equivalent to a level 4 score of 40.

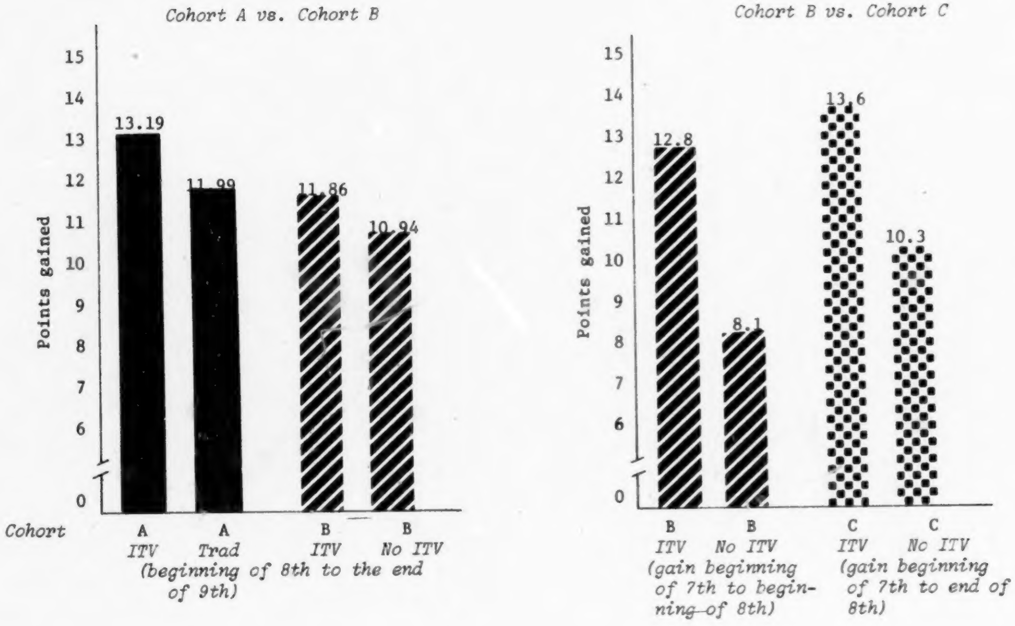


FIGURE VII-4. Gain scores on General Ability Test

seventh and the end of eighth, Cohort C ITV students registered a 13.6 point gain. There is little doubt that had Cohort B students been measured at the end of eighth grade, they would have shown a larger beginning of seventh to end of eighth gain than did Cohort C students.

Differences between Cohort A and B almost surely reflect lower quality of instruction since the two cohorts had almost identical average socio-economic background. As had been noted elsewhere, Cohort A was the pilot group and received special attention that succeeding cohorts did not enjoy. It was not clear whether the differences in gain between Cohorts B and C reflected the lower average academic skills that Cohort C brought to seventh grade, or lower quality of instruction resulting from crowded classrooms, double sessions, heavily burdened teachers and the greater disruption of the last two years. If lower instructional quality was responsible, there would be considerable hope that as the system becomes fully adapted to the large number of students enrolled, some improvement would occur.

In any case, there was still a major gain in basic skills for Cohort C. And while gain was smaller for the Cohort C ITV sample than for the Cohort B ITV sample, it was larger than the gain registered by the Cohort B non-ITV sample. In the beginning of seventh to beginning of eighth period the Cohort B non-ITV students gained only 8.1 points. It is doubtful that they had surpassed the Cohort C ITV gain of 13.6 by the end of eighth grade. Thus, it appears that any loss in learning quality due to the expansion of the numbers of students in school and to the inferior average basic skills of these students was offset by the introduction of the Reform and its ITV component.

The Cost of ITV in El Salvador's Reform

As a part of the over-all evaluation of the educational reform in El Salvador, Richard E. Speagle (1972) prepared an analysis of the costs incurred by the instructional television system. Since budgets are an important constraint on choices, and are apt to become increasingly so in the educational sectors of developing nations (Coombs, 1968), it is important that evaluations provide cost information for decision makers and analysts. This section uses the data gathered by Speagle to provide a summary of the costs incurred by ITV in El Salvador. The first part of the section outlines the methodology used in presenting the cost information; individuals already familiar with the methodology of costing educational technology projects may wish to skim or skip this part. The second part of this section presents the cost results, while the third part discusses a number of factors that have partially offset the add-on cost of ITV.

Methodology

This analysis follows the standard approach of categorizing ITV costs into those of program production, transmission, and reception. These data can then be arrayed in a cost tableau that lists expenditures incurred for each of these purposes year by year; historical data are used to fill in the cost tableau to the extent they are available and planning projections are used for later years. From data in the cost tableau it is possible to construct total, average, and marginal cost functions, and it is possible to obtain estimates of the average cost incurred per student year of use when all costs are considered. This subsection on methodology describes the techniques used for this analysis by drawing on the methods proposed by Jamison and Klees (1973). As a substantial proportion of the expenses of ITV in El Salvador were funded by grants and loans it is important to distinguish between all-inclusive expenditures and expenditures of the Government of El Salvador; methods for doing this are described.

Total, average, and marginal cost: It is useful to think of costs as functions rather than numbers; a total cost function for an input gives the total cost required to finance an input as a function of the amount of the input required. To take an example, let

$$\text{Total Cost} = TC = TC(N),$$

where TC(N) is the total cost required to provide an input of ITV to N students.

The average cost function (or, equivalently, unit cost function) is defined to equal the total cost divided by the number of units of the input provided:

$$\text{Average Cost} = AC = AC(N) = TC(N)/N.$$

Just as the total cost depends on N, so may the average cost.

The marginal cost function gives the additional cost of providing ITV to one more student as a function of the number of students already served. Stated precisely, the marginal cost function is the derivative of the total cost function:

$$\text{Marginal Cost} = MC(N) = dTC(N)/dN.$$

Again, it is important to keep in mind that the marginal cost will in general be a function of N.

When the total cost function can be approximated by the simple and convenient linear form,

$$(1) \qquad TC(N) = F + VN,$$

it becomes possible to separate costs into fixed costs and variable costs. In this example, F would be the fixed cost because the value of cost contributed by the first term on the right hand side is independent of N; V is the variable cost per unit of input because the value of total cost contributed by the second term on the right hand side varies directly with N. When the total cost function is linear, as in equation 1, the average cost is simply equal to the fixed cost divided by N plus the variable cost ($AC(N) = F/N + V$); the marginal cost is equal to V. Thus, the average cost declines as N increases (by spreading the fixed cost over more units) until, when N is very large, the average cost is close to the marginal cost. When the average cost is close to the marginal cost AC/V will be only slightly larger than 1; on the other hand, when AC/V is large the fixed costs have not been spread over many students. AC/V is, then, a good measure of the extent to which economies of scale have been realized in the system.

Equation 1 is a reasonably good approximation to the cost behavior of ITV systems. Program preparation and transmission tend to be fixed independently of the number of students using the system and thus constitute the major part of the fixed cost, F. Reception costs, on the other hand, tend to vary directly with the number of students and are thus included in V.

In order to apply equation 1, one must be able to estimate empirically values for F and V and this means that capital costs, like those for studios, must be combined with recurrent costs in some appropriate way. A capital cost is one that is incurred to purchase a piece of equipment that will have a useful lifetime extending beyond the time of purchase. Recurrent costs, on the other hand, are incurred for goods or services that are used up as they are bought. The principal cost of school systems is the recurrent cost of teachers' time; since teachers are paid while they provide their service, the useful lifetime of what is actually purchased simply coincides with the pay period. The line between capital and recurrent costs is usually drawn at one year; if the useful lifetime of a piece of equipment is greater than that, its cost is usually treated as a capital cost. Coombs and Hallak (1972, Chapter 9) point out that school systems often adhere only loosely to this one year convention and provide a valuable practical discussion of how to plan for school building and facilities costs.

An occasional source of confusion, even among educational cost experts, is between fixed costs and capital costs. There can be fixed costs that are recurrent; an example is the electric power required to operate a television transmitter. Likewise, there can be capital costs that are variable; an example is the receiver component of reception costs. Thus, the concepts of fixed costs and capital costs are distinct though it is often true that major capital expenditures are associated with substantial fixed costs.

How does one construct the cost function of equation 1 if capital costs are present? Jamison and Klees (1973) describe the rationale for the method of doing this, but basically one annualizes the capital cost and adds that to the recurrent cost. Two variables are important in annualizing expenditures on capital equipment. The first of these is the lifetime of the equipment; if the equipment lasts n years, a fraction, on the average equal to 1/n, of its cost should be charged to each year. This is a depreciation cost. The second variable that is important in annualizing capital expenditures is the social discount rate. The social discount rate reflects a value judgment concerning the cost to society of withdrawing resources from consumption now in order to have something of value later. Values used for the social discount rate are expressed as rates of interest and have values similar to, though often lower than, private rates of interest. The value used in this analysis will be 7.5 percent per annum; this is typical of the values considered appropriate for development plannng. If we are given an initial cost, C, for an item of capital equipment, its lifetime, n, and the social rate of discount, r, the annualized cost of the capital is given by a(r,n)C, where the annualization factor a(r,n), is given by equation 2:

$$(2) \qquad a(r,n) = (r(1+r))^{n} / ((1+r)^{n} - 1).$$

For the analysis here, $r = .075$ and n has a value that depends on the nature of the capital equipment considered.

With equation 2 it is possible, then, to convert capital costs to annual ones so that the parameters F and V of the cost function, equation 1, can be estimated. This enables one to handle the temporal problem that arises because capital expenditures cause a lumpy distribution of costs across time. Student utilization across time is also uneven -- low at the outset and high later -- and for this reason it is important to introduce a notion of average cost that incorporates utilization data as well as expenditure data (2). This is described next.

Computation of average costs: The purpose of these paragraphs is to describe a method for displaying the unit costs of the ITV component of El Salvador's Educational Reform that takes explicit account of the time structure of utilization as well as of costs and that allows examination of costs from a number of time perspectives. The question of time perspective is important. Before undertaking the Reform, El Salvador faced the substantial investment costs required to buy equipment, develop programs, and start up the operations, three or four years later these costs had been incurred to a substantial extent and the cost picture facing the Ministry of Education was very different indeed. By then, initial capital costs were sunk, and except for the potential (slight) resale value of equipment, there was nothing to be recovered from abandoning the project. What is desirable, then, is a method for displaying costs from the perspective of a decision-maker prior to commitment to a project, one year into the project, two years into the project, etc.

It is also desirable to consider various time horizons for El Salvador. What will the average costs have been if ITV is abandoned after three more years? Allowed to run for 15 years? This suggests the value of looking at average costs as seen from year i of the project with a horizon through year j. The "average cost from i to j" is denoted by the symbol AC_{ij} and is defined to mean total expenditures on the project between years i and j divided by total usage of the project (number of students) with both costs and usage discounted back to year i by the social rate of discount, r. Let C_k be equal to the total amount spent on the project in year k, including fixed and variable costs, and capital and recurrent costs. Let N_k be the total number of students using the system in year k (3). Then AC_{ij} is given by equation 3.

$$(3) \quad AC_{ij} = \frac{\sum_{K=i}^{j} C_k/(1+r)^{k-i}}{\sum_{K=i}^{j} N_k/(1+r)^{k-i}}$$

A decision-maker at the beginning of i can in no way influence expenditures or student usage before time i so that costs and benefits incurred up to that time are for his decision irrelevant and are not incorporated into AC_{ij} What AC_{ij} tells him is the cost per student of continuing the project through year j, under the assumption that year j will be the final year of the project. By examining how AC_{ij} behaves as j varies, the decision-maker can obtain a feel for how long the project must continue for unit costs to fall to the point of making the continuation worthwhile. When the decision-maker is considering whether the project should be undertaken at all, he should let $i = 1$; i.e., he should compute AC_{1j} for various values of j, to see how long it takes before average costs drop to a reasonable level. Once into a project the decision-maker should use the value of i corresponding to his present position; in El Salvador now the most relevant figures for decision-makers are AC_{8j}, that is from the perspective of year 8 of the project's inception.

The analysis of costs for El Salvador will present values of AC_{ij} for many values of i and j for a social discount rate of 7.5 percent. The values of AC are also given for both all-inclusive costs and costs incurred by the Salvadoran government. It should be kept in mind that AC is a separate concept from that of the average cost function AC(N) discussed earlier. The average cost function tells what the average cost would be for each value of N, under the implicit assumption that N remains the same from year to year. AC(N) is a measure of cost only, not of actual utilization; its value is as an over-all summary measure of unit cost. AC_{ij}, on the other hand, is a measure based on actual (and projected) costs and utilization viewed from and to specific points in time; in particular, AC_{ij} takes into account the time pattern of student utilization. Both AC(N) and AC_{ij} are useful measures and estimates of both for El Salvador are reported below.

Grants, Loans, and Loan Repayment

The basic costs to be computed in the next sub-section are all-inclusive costs; costs to the Salvadoran government will, of course, be less. In order to adjust all-inclusive costs for grants one simply subtracts the amount of the grant in the given year from the all-inclusive costs of that year. Loans are somewhat more complicated because they must at some point be paid back. The loans negotiated by El Salvador have a 10 year grace period before repayment is to commence. Thus, in early years of the project the loans in a given year are, like the grants, simply subtracted from the all-inclusive costs. In later years the repayments must be added to the all-inclusive costs in order to obtain total costs to the government.

Computing the amount to be repaid in each of the later years is complicated by lack of knowledge of the inflation rate of the dollar. The loans are negotiated in fixed dollar terms so the higher the rate of dollar inflation the lower the real value of the loan repayments, that is, the lower the value expressed in fixed dollars (1972 dollars are used as the base in this report). The situation is exactly analogous to that of a homeowner with a mortgage; in times of high inflation he gains because the value of his debt is fixed in dollar terms. Inflation rates for the dollar are unpredictable even, it now appears, several months, much less 10 years in advance. For this reason, the value used in this report, 4 percent, should be regarded as only an estimate. Given the value of the loans, the interest rates they bear, their repayment schedules, and the rate of inflation for the dollar, one can use standard accounting formulas to determine the annual repayment in terms of 1972 dollars. These repayments begin in 1980 and as of that year costs to the Salvadoran government must be determined by adding the loan repayments to the all-inclusive costs.

The Cost of ITV in El Salvador

This subsection applies the methods just described to analysis of the cost data that were gathered by Speagle (1972). First, a cost tableau is presented, then based on the cost tableau, total cost functions and average cost values are developed.

Cost tableau: Table VII-2 presents the basic cost tableau; this is reproduced from Jamison and Klees (1973). The table presents costs in various subcategories of production, transmission, and reception on a year by year basis; the figures for 1966 to 1973 are based primarily on Speagle's comprehensive analysis and the figures from 1974 on are projections based on the planned growth rate of enrollment. All costs in the table are inflation corrected and are expressed in 1972 U.S. dollars.

Year by year figures for total (all-inclusive cost) are presented below the costs by category; underneath the row giving total cost is

TABLE VII-2

Cost of ITV in El Salvador for Third Cycle Schools*
(Thousands of 1972 U.S. Dollars)

	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
PRODUCTION																							
Facility					234	108	36	36							36	36							
Equipment			50	270	40	966							50	270	40	966							
Operations				300	370	410	490	490	490	490	540	540	540	540	540	540	540	540	540	540	540	540	540
Start-up	50	50	380	360	260	210	200	200	100	50													
Video-Tape				51	51	51			51	51	51			51	51	51			51	51	51		
TRANSMISSION																							
Facility					26	12	4	4							4	4							
Equipment						644										644							
Operations				20	20	40	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
RECEPTION																							
Classroom Remodeling			1090																				
Equipment			50		120	120	120	53	62	80	13	13	13	18	13	18	18	18	13	18	18	22	18
Replacement								50		120	120	120	103	62	200	133	133	116	80	213	151	151	134
TOTAL COSTS	50	50	1570	1001	1121	2561	860	843	713	801	734	638	716	951	934	2402	701	684	694	832	770	733	702
FOREIGN AID & DEBT REPAYMENT			(190)	(680)	(300)	(1980)	(320)	(320)							45	45	45	45	45	45	45	45	45
TOTAL COST TO GOV'T	50	50	1380	321	821	581	540	523	713	801	734	638	716	951	979	2447	746	729	739	877	815	768	747
NUMBER OF STUDENTS (in thousands)				2	14	32	48	60	72	86	104	107	110	113	117	120	124	128	131	135	139	144	148

*footnote starts on next page

Footnote to TABLE VII-2

Cost data are based mainly on Speagle (1972) for 1966 to 1973.

Production facility. Ninety per cent of the costs of the Santa Tecla facility were allocated to production and 10% to transmission, with the life of the air conditioning assumed to be 10 years and the facility life to be 25 years.

Production equipment. This assumes a 10 year life, with the cost of the Santa Tecla equipment allocated 60% to production and 40% to transmission.

Production operations and start-up. These are the same as Speagle until 1974 when start-up costs are assumed to decrease over two years to a $50,000 level. After 1975 they remain at this level and are included in the cost of operations which are based on Speagle's projection.

Video tape. It is not clear whether these costs are included in TABLE 2.1 of Speagle. They are added here, purchased as needed, under the assumption of a 5 year tape life, 300 hours of programming a year, and a cost of an hour length video tape of $170.

Transmission facility. This is explained under production facility.

Transmission equipment. This is explained under production equipment.

Transmission operations. This represents the rental charge through 1971 for the use of commercial broadcast time. Beginning in 1972 operations are estimated to cost 25% of the 1971 rental charge.

Classroom remodeling. This is the same as in Speagle, with an assumed 25 year lifetime.

Reception equipment. Beginning in 1973 this is based on the number of students added to the system, an average class size of 45, and a cost per receiver of $200.

Foreign aid and debt repayment. Through 1973 this represents the actual size of foreign grants and loans. The loan portion of this aid is paid off with a 10 year grace period during which interest accumulates at 2% and a 30 year repayment period during which interest accumulates at 2.5%. With our assumption of a 4% annual rate of inflation these effective interest rates become -2% and -1.5% respectively. If there were no inflation present, value of the repayment amount would be almost three times as large. The repayment is scheduled as if the 40 year period for the total loan began in 1970.

Number of students. This is assumed to grow rapidly from 1972 to 1976 (about 20% per year) after which a 3% growth rate is accounted for mainly by population growth.

The cost data do not include teacher training (not considered by Speagle as part of ITV costs), the distribution and printing of teachers guides and student workbooks, nor maintenance and power costs for reception equipment (Speagle says this latter is extremely small).

the row showing foreign aid and debt repayment. The numbers in parenthesis in this row show the total amount of grant or loan money received that year for the ITV system; the number in parenthesis is then subtracted from the all-inclusive cost to give the cost to the government for the given year. Beginning in 1980, the numbers in this row represent loan repayment; costs to the Salvadoran government are computed by adding the loan repayment to the total incurred expenditures. The values for loan repayment were computed using the methods described in the preceding subsection.

The final row of Table VII-2 shows past and projected future student usage of the system. Usage increases rapidly until 1976 when most of the relevant age population is assumed to be covered; thereafter, usage increases at the school age population growth rate of approximately 3 percent per year (4).

The footnote to Table VII-2 provides somewhat more information on the source of the figures in the various categories; readers interested in a detailed discussion of the various cost components should consult the comprehensive treatment by Speagle (1972). This report will provide no further discussion of these component cost estimates except to expand briefly on the cost of program production.

Program production costs exceed the sum of transmission and reception costs by a factor of two or three. It is for this reason important to examine these costs in some detail and Speagle (1972, pp. 72-78) provides a breakdown of the operating costs of program production. However, a very substantial fraction of program production costs are capital costs and it is important -- particularly for planners from other countries -- to obtain an estimate of total production costs, not just the operating costs of program production. Table VII-3, using cost data from Table VII-2, presents the component and total costs of program production, including annualized capital expenditures at a 7.5 percent discount rate; the total of $979,000 per year is almost twice the recurrent cost of $540,000 per year. At the estimated production rate of 1,000 20-minute programs per year, the cost per hour of program production comes to about $2,940.

The total cost function for ITV: Using the data from Table VII-2, it is possible to obtain a cost function for ITV in El Salvador. The program production and transmission costs are considered fixed (they constitute the F of equation 1) and reception costs are variable with the number of students (they constitute the V of equation 1) Start-up costs were treated as an initial capital investment in the system and were annualized over the assumed 25-year lifetime of the system. The 1972 student enrollment estimate of 48,000 was used along with the assumption of an average of 170 hours of program presentation per grade per year. The enrollment figures allow calculation of AC and AC/V; the program presentation assumption allows computation of costs per student hour of viewing. The total cost equation (expressed in 1972 U.S. dollars) for the system is as follows, assuming $r = 7.5$ percent (5):

	Total cost equation	AC	AC/V	student-hr. cost
(4)	$TC(N) = 1,116,000 + 1.10N$	24.35	22.14	.143

TABLE VII-3

Costs of Program Production[*]

Cost Category	Amortization Period[**]	Cost	Annualized C
Facility (building)	25 years	342	31
Facility (air conditioning)	10 years	72	10
Equipment	10 years	1326	193
Start-up	25 years	1860	167
Video-tape	5 years	153	38
Operations (recurrent)	--	--	540
TOTAL			979

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[*] These costs are expressed in thousands of 1972 dollars.

[**] The amortization period is the number of years the cost item is assumed to last; start-up costs are amortized over an assumed 25 year life for the project.

[***] The annualization was done using equation 2 with a social discount rate of 7.5% per annum.

With twice as many students using the system (N=96,000), average costs fall to \$12.73 and per student-hour costs fall to \$.075. This substantial reduction is possible because of the initially high value of AC/V.

The above total cost equation 4 is for all-inclusive costs; it is also of value to compute a cost equation that includes only costs to the Salvadoran government. To do this one must reduce the fixed cost components of the above equation by an annualized equivalent of the grants and loans. To find this equivalent, the present value of the 30-year loan repayment series was calculated, and this was subtracted from the total amount of the foreign grants and loans (the total amount was assumed to occur in the year 1970). The resulting figure was annualized over the 25-year assumed lifetime of the project and subtracted from the fixed costs. The government cost equation is as follows:

(5) total cost equation	AC	AC/V	student-hr. cost
$TC(N) = 799{,}000 + 1.10N$	17.75	16.13	.104

It should be observed that the net grant and loan contribution to the ITV system is substantial. At the 7.5 percent social rate of discount, foreign contributions cover about 27 percent of the system's cost. This 27 percent is based on 48,000 students per year using the system; as the entire cost of expanding the system is borne by El Salvador, the percentage of foreign contribution will decline as usage increases. Because of the high value of AC/V though, the decline is only to a little over 25 percent when the student usage reaches the 104,000 projected for 1976 (6).

The cost equations of the preceding paragraphs provide a reasonably clear picture of system costs as a function of N, the number of students per year using the system. In order to assess accurately the actual average costs incurred, account must be taken of the time structure of student usage, and this is done in the computations of values for AC_{ij} that follow.

Average costs of ITV in El Salvador: The data in Table VII-2 suffice to calculate values of AC_{ij} for El Salvador for the years 1966 to 1988. Letting 1966 equal year 1 (and therefore 1973 equals year 8), one can use equation 3 to compute all possible values of AC_{ij} both for all inclusive costs and for costs to the government. These computations depend, of course, on the accuracy of the enrollment projections in the last row of Table VII-2 and deviations from those projections would induce corresponding deviations in average costs.

Figure VII-5 displays values of AC_{1j} graphically. One can see from that graph that if the social discount rate is 7.5 percent, the average costs through year 12 of the project (i.e. through 1978) will have been about $24 per student per year. What this means is that total expenditures up to 1978 divided by total student usage up to 1978 (each properly discounted) will equal $24. If one extends the time horizon to 24 years (1988) the result comes to about $17. The bump in the curve that occurs near year 15 (1981) results from the need to replace production and transmission equipment at that time.

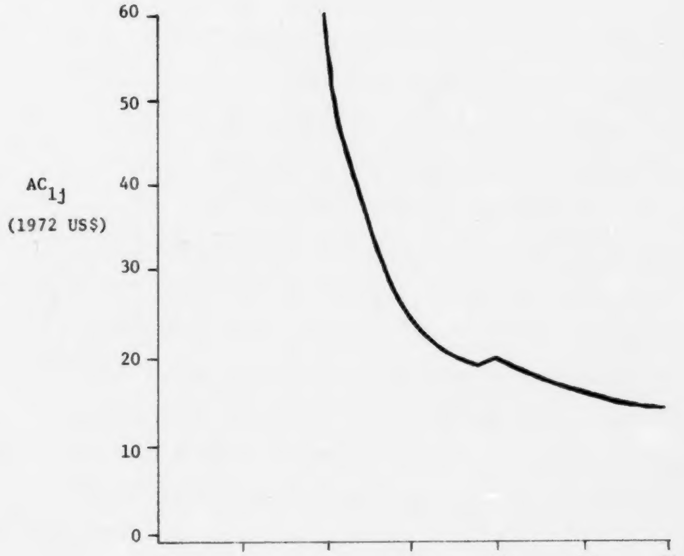

FIGURE VII-5. AC_{1j} for the Total Cost of ITV in Third Cycle

Figure VII-6 displays the same information as Figure VII-5 except that costs are viewed from the present (1973) rather than from the beginning of the project. Notice that the scale on Figure VII-6 differs from the one on Figure VII-5 and that values of AC_{8j} for j less than 8 are undefined (indicated by the flat part of the curve). From the time perspective of the present, average costs through year 12 (1978) are, of course, much less than the \$24 of $AC_{1,12}$; the value of $AC_{8,12}$ is about \$8.50 for a 7.5 percent discount rate. This \$8.50 is the total projected expenditure between now and 1978 divided by the projected number of years of student use between now and 1978, each properly discounted. The small bump at year 15 on Figure VII-5 is much magnified in Figure VII-6; this is both because the fixed replacement costs are a larger fraction of average costs viewed from 1973 and because they are less discounted since they are by 1973 much nearer in the future.

Table VII-4 presents exact computations of AC_{ij} based on a 7.5 percent discount rate and the figures in Table VII-2 for total cost. The top row of Table VII-4 corresponds to the graph in Figure VII-5 and its fifth row corresponds to the graph in Figure VII-6. Table VII-5 presents the same computations for costs to the Salvadoran government instead of all-inclusive costs; except in the lower right hand corner, costs in Table VII-5 are lower than corresponding costs in Table VII-4. The appropriate cost to use depends on one's vantage point. At the time of El Salvador's initial decision, the long run average cost to the government $AC_{1,24}$ (7) in Table VII-5 was the most useful number for El Salvador to consider; at the present, for long term planning, the values of $AC_{8,24}$ are perhaps most useful; on the other hand, for

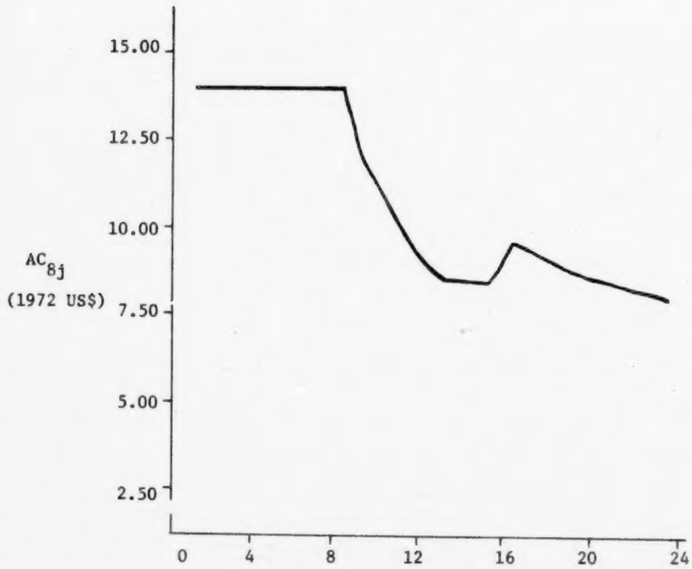

FIGURE VII-6. AC_{8j} for the Total Cost of ITV in Third Cycle

TABLE VII-4

Average Total Costs from Year i to Year j for Third Cycle Schools*
Interest Rate = 7.5%

	TO YEAR j										
	1968	1970	1972	1974	1976	1978	1980	1982	1984	1986	1988
FROM YEAR i											
1966		254.95	82.72	44.49	29.84	23.11	20.01	18.88	17.14	15.95	14.97
1969		134.63	60.50	34.24	23.71	18.73	16.53	15.96	14.59	13.67	12.89
1971			43.71	24.90	17.75	14.35	13.02	13.00	11.99	11.33	10.75
1972			17.92	13.55	10.95	9.45	9.15	9.80	9.18	8.80	8.44
1973				11.78	9.69	8.46	8.37	9.21	8.64	8.31	7.98
1974				9.75	8.52	7.58	7.73	8.77	8.23	7.92	7.61
1975					8.00	7.12	7.43	8.66	8.08	7.77	7.45
1976					6.95	6.48	7.09	8.58	7.95	7.63	7.30
1977						6.23	7.13	8.90	8.11	7.72	7.34
1978						6.51	7.55	9.57	8.47	7.96	7.50
1980							7.89	11.17	8.98	8.15	7.53
1984									5.21	5.58	5.32
1988											4.74

*

TABLE VII-5

Average Government Costs from Year i to Year j for Third Cycle Schools*
Interest Rate = 7.5%

	TO YEAR j										
	1968	1970	1972	1974	1976	1978	1980	1982	1984	1986	1988
FROM YEAR i											
1966		177.52	44.19	25.37	18.39	14.93	13.56	13.52	12.51	11.84	11.25
1969		70.79	24.48	16.28	12.96	11.04	10.47	10.92	10.25	9.81	9.40
1971			13.99	11.20	9.85	8.78	8.68	9.43	8.94	8.63	8.33
1972			11.25	9.84	8.98	8.10	8.15	9.03	8.57	8.29	8.01
1973				9.26	8.56	7.74	7.87	8.87	8.40	8.13	7.85
1974				9.75	8.52	7.58	7.78	8.89	8.38	8.09	7.80
1975					8.00	7.12	7.49	8.79	8.25	7.96	7.65
1976					6.95	6.48	7.16	8.73	8.14	7.84	7.52
1977						6.23	7.22	9.07	8.32	7.95	7.58
1978						6.51	7.68	9.78	8.72	8.22	7.77
1980							8.27	11.55	9.33	8.51	7.88
1984									5.56	5.92	5.64
1988											5.05

*The costs are in 1972 US. Dollars.

present short term expansion or contraction decisions, the marginal costs are the appropriate ones to use (8). If El Salvador had not had grant and loan opportunities, the all-inclusive costs of Table VII-4 would be more appropriate.

In terms of what others can learn from El Salvador's experience, the most useful number is perhaps the long term average cost viewed from when El Salvador commenced expenditure. At the 7.5 percent discount rate, this number, $AC_{1,24}$ is seen from Table VII-4 to be $14.97, say, $15.00. If the students view an average of 170 hours of ITV per year, the cost per student hour is $0.09. It should be kept in mind that these costs assume that the system continues operating through 1988 and, mor importantly, that the rapid expansion of enrollments projected in Table VII-2 is in fact attained.

The cost of ITV is necessarily an add-on to whatever else may be provided the students. The introduction of ITV may, however, facilitate reduction of other costs and the next subsection considers very briefly the factors that may allow offsetting of ITV costs.

Factors Offsetting the Cost of ITV

This subsection presents a very brief analysis of how ITV costs have in part been offset by reduction of other input factors to the schooling process. The principal cost of conventional instruction is, of course, teachers' time and the offsetting factor to be considered here is reduction in teacher time per student. The amount of teacher time expended per student depends on class size, C, and the relative length of the student and teacher school weeks. If h_s is the number of hours in school per week of a full-time student and h_t is the number of hours per week of a full-time teacher, the student-to-teacher ratio, S, can be defined to equal $(h_t/h_s)C$. Thus, if teachers teach two full shifts $(h_t/h_s = 2)$, and the average class size is 40, the student-to-teacher ratio will equal 80. ITV costs can be offset by increasing that ratio through increases in C or h_t or through decreases in h_s. If the mechanism is through increases in teacher hours, teacher salary increases must be less than proportional to those hour increases.

In El Salvador the introduction of ITV has tended to reduce costs by increasing both teacher hours and class size; counterbalancing these cost reductions are, of course, the costs of providing the ITV. This subsection provides approximate estimates of the instructional expenditures (9) per student as we assume it would have been if ITV was not introduced, E(no ITV), and as it was after the introduction of ITV, E(ITV). These estimates are based on occasionally shaky or inconsistent data but are probably accurate to within 15 percent.

After the Reform instituted changes in the school week, students attended 25 hours of classes each week. A full load for teachers who were not assigned to double sessions was also 25 hours $(h_s=h_t=25)$. Prior to the great expansion in the numbers of students attending Third Cycle which began in 1971, average class size was no more than 35. If we use that as an estimate for class size, and 25 hours as estimates of both student week and teacher week, the student-teacher ratio was 35:1. At a salary of $1800 per year (10) for a 25-hour work week, which was the 1972 cost, the instructional expenditure per student was $52 per year. If the Reform had been mounted without ITV and traditional class size had been maintained, that would have been the cost per student.

However, ITV was introduced, and accompanying it were two other changes affecting cost per student. Average classroom size was increased, as smaller Third Cycle schools were closed and more students matriculated at the schools remaining open. At the same time, teacher load was increased from 25 to 35 hours (an increase of 40 percent) while teacher salaries were only increased by 20 percent to $2,165 (11). While one cannot say definitively that such changes would not have occurred unless ITV had been introduced, that may be a reasonable assumption. Certainly the Ministry planners believed that one of the advantages of extending ITV to primary schools would be "to help the teacher who sees himself as overburdened by his work day with double sessions" (12).

Given the longer work week, the teacher cost per student equals the teacher wage divided by the student-to-teacher ratio; i.e., it equals $2,165/S; since $S = (h_t/h_s)C = (35/25)C$, the teacher cost per student equals $1546/C, where C is the class size after the introduction of ITV. In addition to teacher costs, one must consider television costs per student to the government; equation 5 summarized these costs. The annualized ITV costs per student are seen from that equation to equal $799,000/N + $1.10, where N is the number of students using the ITV system. The sum of this plus teacher costs give the per student costs with ITV, E(ITV):

$$(6) \quad E(ITV) = \$1,546/C + \$799,000/N + \$1.10$$

It is not yet clear what the average class size will become after El Salvador's Educational Reform is fully implemented. In order to illustrate how class size and N jointly affect the per student costs, Figure VII-7 shows how E(ITV) varies with N for three values of C; C = 35; C= 40; and C = 45.

Figure VII-7 also shows E(no ITV), the assumed instructional cost if ITV had not been introduced, of $52. E(no ITV) does not, of course, vary with N. All points on the E(ITV) curves that lie below the E(no ITV) curve indicate combinations of class size and total enrollment that result in having instructional costs per student be less with ITV than without. For example, if C = 40 in Figure VII-7, this indicates that with more than 60,000 students using ITV, the cost per student per year would be less with the ITV system than without the changes in class size and teacher hours which accompanied the introduction of ITV. It thus seems quite possible that the use of ITV in the Reform in El Salvador will be accompanied by a reduction in unit costs.

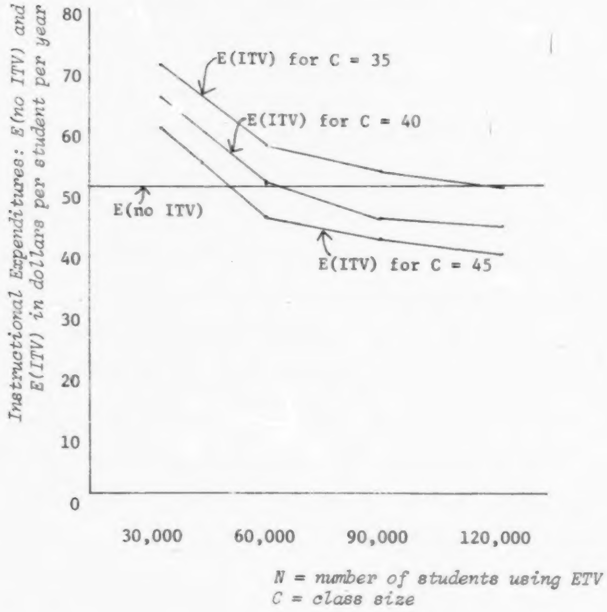

FIGURE VII-7. Instructional costs per student per year

Summary and Implications

The research on the efficiency and costs of El Salvador's use of ITV and other key elements of the Educational Reform produced the following results:

1. Enrollments in the Third Cycle of the public school system expanded by 300 percent (from 19,104 to 65,390) between 1968 and 1973. The increases reduced the traditional bottleneck between sixth and seventh grades, so that almost 60 percent of the students entering sixth grade in 1971 continued on to seventh in 1972.

2. The number of dropouts and repeaters within the Third Cycle diminished after the initiation of the Reform in 1969. This increased efficiency may have been the result of an easing of standards as well as of the improved quality of teaching. However, its continuation was assured after the 1971 introduction of Oriented Promotion. That policy entailed a commitment to pass all students to the next grade except in rare cases of excessive absence and extremely poor performance.

3. With the increase in enrollment, more students from disadvantaged backgrounds entered the Third Cycle. These students began seventh grade with poorer academic skills, and they learned less than their more advantaged predecessors. However, ITV students in the least advantaged cohort still learned more than non-ITV students in the preceding more advantaged cohort.

4. Costs for the ITV system were divided into two components; fixed costs (including studio facilities, production costs, etc.) which are the same whether one student or 1,000,000 students are watching, and

variable costs (television receivers, student workbooks, etc.) which increase with the number of students in the audience. The total fixed costs per year (apportioning the cost over 25 years of the project to each year under assumptions specified in the text) were estimated at $1.1 million. Of that sum, approximately $800,000 was the the cost to the Salvadoran government; the rest consisted of grants from USAID and other foreign agencies. For each additional student in the system, the yearly cost was about $1.10. Thus, in 1972 when 48,000 students were enrolled, the per student cost to the government of El Salvador alone was $17.75, while the total cost to the government of El Salvador and others was $24.35. In a hypothetical year in which 96,000 students are enrolled, the total per student cost would be $12.73, and the cost to the Salvadoran government, $9.42.

5. Knowing the number of students actually enrolled in the first seven years of the project, and projecting enrollments through year 25 of the project, it was possible to estimate the average cost per student during any part of that period. This perspective recognizes that in the early years of a project fewer students are likely to be served, but as the project matures many more students are included. Over the full 25 years, the average yearly cost per student is estimated to be $17.

6. The introduction of ITV was accompanied by an increase in the number of students per class (from 35 to 45) and an increase in teacher load (40 percent additional classroom hours) with only a 20 percent increase in teacher pay. These changes offset the add-on cost of ITV. In a year in which 60,000 students were using ITV, the per student cost

of classroom teacher plus television ($47) was lower than the per student cost ($52) would have been had ITV not been used, class size not increased, and teacher load not changed. As student enrollments increase beyond 60,000, the per student cost of the ITV system continues to decrease, while the non-ITV system per student cost does not change.

El Salvador's decision-makers had three somewhat contradictory objectives as they planned their Educational Reform. They wished to expand enrollments at the post-primary level; they wished to hold down budget increases and, if possible, decrease per student costs; and they wished to increase the quality of instruction.

If only the first two objectives were to be met, expanded enrollment at a minimum increase in budget, ITV and the Reform were unnecessary. These objectives could have been satisfied by adopting policies which stimulated enrollment (free tuition and Oriented Promotion) and lowered per student cost (increased class size and teaching loads). However, if the need to maintain or improve instructional quality was also to be satisfied, these measures would have been inadequate. Overburdened teachers and crowded facilities would not have been able to maintain learning quality. Expansion without instructional reform would thus have led to a considerable decline in learning as more students from disadvantaged backgrounds entered the system.

ITV, introduced in the context of the Reform, did satisfy the objective of maintaining quality. The evidence for this has been presented in previous chapters. The findings indicate that maintenance of quality was not done at the cost of either limitation on enrollment or unacceptable per student cost. A potential threat to instructional quality was certainly created by increasing class size and teaching load, effectively raising student-teacher ratio from 35:1 to 53:1. However, such a threat was eliminated by introducing ITV and the Reform. In fact, when enough students were enrolled, the savings in per student cost gained by increasing the student-teacher ratio was greater than the add-on cost of ITV. Thus, not only was there no threat to instructional quality as a result of increasing student-teacher ratio, but the per student cost was lowered.

The question remains whether there might have been some other instructional reform that, coupled with the increase in the student-teacher ratio, could have been both as effective and less expensive than ITV. It was clear that a 50 percent increase in student-teacher ratio was large enough to permit a considerable investment while not increasing per student costs. Evidence about learning presented in earlier chapters suggested that the Reform without ITV would not have been sufficient to maintain learning quality. However, no information was gathered on alternative instructional systems. It cannot be said, therefore, whether an investment in radio or some other technology, or an additional investment in teacher retraining and salaries and/or classroom resources would have been a satisfactory alternative.

Footnotes

(1) These are not refined dropout figures since ninth grade enrollments include repeaters and others who may not have been students in seventh grade two years previously and exclude students who entered with the proper seventh grade cohort but will require more than the usual two years to finish Third Cycle.

(2) Dividing equation 1 by N gives the average cost associated with a particular value of N. Since N varies with time, generally increasing as the system matures, it is desirable to obtain an average cost that accounts for that time variation.

(3) It may aid in understanding equation 3 to explain the concept of the present value of a cost. Assume that a cost of $4,000 is to be incurred eight years from now. The present value of that cost is the amount that would have to be put aside now, at interest, to be able to pay the $4,000 in eight years If the interest rate is 6 percent and we put aside an amount z now, in eight years we will have $z(1.06)^8$, assuming annual compounding. If we are to have $4,000 at the end of the eighth year, $z(1.06)^8$ = $4,000, or z = $4,000$(1.06)^8$. Z is the present value of $4,000 eight years from now when the interest rate is 6 percent; its numerical value is $2,509.65. The numerator of equation 3 is the present value incurred between years i and j. The denominator is the present value of student utilization.

(4) Very recent planning estimates indicate that the enrollment estimates in this table for the late 1970's may be 10 percent to 15 percent too low.

(5) Jamison and Klees (1973) examined the sensitivity of the cost estimates to the value chosen for the social discount rate; increasing it from 7.5 percent to 15 percent increases AC by about 20 percent. This is a substantial amount, due to the highly capital intensive nature of the project.

(6) In comparing the average costs in total with those to the Salvadoran government, it is an interesting fact that the latter is totally insensitive to the social discount rate. This results from a somewhat coincidental balancing of two factors: on the one hand increasing the social discount rate increases capital costs, but on the other hand it increases the value of foreign loans.

(7) 1966 corresponds to year 1 and 1988 corresponds to year 24.

(8) A more detailed analysis of El Salvador ITV costs, including discussion of expanding the system to the First and Second Cycles, may be found in Jamison and Klees (1973).

(9) This report uses the term "instructional expenditures" to denote the costs of the teacher and television. It thus excludes costs for school administration, classroom space, and student supplies which are assumed to be the same with or without ITV.

(10) ODEPOR, "Plan Quinquenal de Ramo Educacion 1973-1977." June, 1972, p. 33.

(11) Ibid, p. 33.

(12) Ibid, p. 33.

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Chapter VIII

Administrative Problems of Introducing ITV

In addition to the learning, attitude, and cost measures used to evaluate the effectiveness of the ITV System within El Salvador's Educational Reform, close attention was also paid to decision-making processes and to the ways Salvadoran officials and their foreign advisers reacted to the numerous problems that confronted them. As numerous case studies point out, the introduction of television into a nation's school system is not an easy task. A review of other ITV projects founded in the last decade reveals that not one was free of serious administrative problems. How such problems were identified and dealt with determined perhaps more than any other single factor whether or not the projects were eventually able to achieve their objectives. It was this complex process of problem recognition and resolution that the study of administrative history was meant to illuminate.

The task of understanding the critical administrative problems that were encountered in the course of introducing a national ITV system was complicated by the fact that television was by no means the only educational innovation undertaken by the Salvadoran government as part of its ambitious five-year plan. For this reason, the nature of the other reforms, their manner of implementation, and their particular relationship to ITV were basic concerns of the administrative research.

Four data sources were relied upon to compile an administrative history. The first included documents published by the Ministry of Education specifying the objectives and nature of the various reform programs. Among these documents were the annual reports which El Salvador's ministers of education customarily present before their country's National Assembly. USAID's records provided a second source of archival material. Such records included copies of the original ITV feasibility studies, documents pertaining to the loan agreements signed by El Salvador and the United States, as well as the monthly reports and numerous administrative memoranda submitted by USAID's contract employees who worked alongside Salvadoran counterparts on all aspects of the Reform. The firsthand knowledge and experience that the field researchers gained from their close association with the Reform over more than four years constituted a third source of administrative data. The research team participated in many meetings within the Ministry of Education, and they attended the weekly staff briefings held by USAID's education officers. As a follow-up technique for exploring in greater detail the information obtained from reviewing formal documents and for validating the insights gained through participant observation, in-depth interviews of Ministry personnel and their foreign advisers were conducted. The advisers were customarily interviewed at the end of their tours of duty while Ministry of Education officials were interviewed during the summer of 1971 and again at the end of the 1972 school year.

In retrospect, it appeared that five broad administrative concerns, challenged Salvadoran decision-makers in the first five years:

the management of the ITV system
the integration of ITV with other educational reforms
the maintenance of national initiative and control
the role of foreign advisers
the evaluation and revision of reform objectives.

Readers who wish to study the Reform's history in greater detail should consult sections of earlier research reports dealing with administration, and especially "An Administrative History of El Salvador's Educational Reform", published in November, 1971. These documents discuss the origin and early years of the Reform, highlighting the particular problems that confronted decision-makers on a year by year basis. For those readers who do not have access to the above mentioned research reports but who still wish to gain some historical perspective, a brief chronology of the Reform's most important events is presented in Appendix B.

The Management of the ITV System

The management of the ITV system required, above all, the coordination of diverse tasks and talents. Scripts must be prepared far enough in advance so that visual materials could be collected; rehearsal time had to be provided so that television teachers could become thoroughly familiar with their lessons; and accompanying classroom guides and workbooks had to be distributed well in advance of the transmission dates. The blending together of such activities determined the quality of the broadcasts and whether or not they were used effectively in the classroom. Most of the administrative problems encountered by the Salvadorans in introducing ITV were due to the complexity of the their system and the inexperience of their personnel.

Problem of Training

It had been difficult to identify the best candidates for the new ITV positions because no Salvadoran teachers had the training or experience that was required to act competently as television teachers, directors, or guide writers. Furthermore, the task of evaluating the potential candidates for such positions was extremely frustrating. To narrow the field, the project's leaders placed a heavy emphasis on academic credentials. Accordingly, all members of the production teams were required to be university or Superior Normal School graduates. In addition, achievement tests were administered to determine which candidates had the greatest mastery of the particular subjects which were to be taught on television. With the exception of a few teachers who had taken a television production course sponsored by UNESCO in 1966, the original ITV staff was given little training before being assigned to jobs in the new system in the fall of 1968. This meant that the majority of television teachers, directors, and guide writers were forced to learn on the job. Such a sink or swim situation had some advantages: it forced different sections to depend upon one another from the start and, even more important, it generated pride and self-confidence among the production teams that they could do the job. Such self-confidence might have been severely retarded had the Salvadorans opted for the alternative training model of allowing foreign advisers to take charge of production until such time as local personnel could be trained thoroughly in an apprenticeship program.

Yet, the on the job approach to training also had certain limitations. Above all, it was time consuming and therefore prevented the organization of any systematic training effort outside the studio. One of the great frustrations of the first contingent of foreign advisers was their inability to sustain interest in a formal training program for ITV personnel. When a seminar in pedagogy was organized midway through the first year of broadcasting, lack of time and interest among the ITV staff resulted in frequent absences and the eventual cancellation of the course. The demise of the seminar and the subsequent refusal of ITV personnel to participate in courses offered by the San Andres Normal School reduced collaboration between the two groups and undermined the arguments that had been advanced for placing the studio alongside the Normal School in the first place.

Although members of the ITV production teams received very little training before they began taping programs, the orientation courses they were required to attend in order to qualify for a position on the ITV staff did provide them with some rudimentary knowledge of television teaching. Unfortunately, the same cannot be said for the technicians who operated the cameras and other studio equipment. These individuals were hired and put to work with only the barest preparation. Over time, they were expected to master the operation of complicated equipment and to respond professionally to technical directions from the control room. By the end of the first year, the studio staff was also working in a reasonably efficient manner, although many programs had to be remade in the second year due to technical errors that might have been avoided had more attention been given to the training of studio personnel in the early stages of the project. The lack of foresight in this area was exemplified again in the second year of broadcasting when another full studio crew was hired and put to work with only a few hours of training.

The Problem of Delays

By beginning televised instruction one grade at a time, El Salvador avoided many administrative problems that other projects encountered by trying to introduce ITV into a number of grades simultaneously. Also, by limiting television's expansion to a few pilot classrooms before expanding to a full grade, El Salvador was able to identify problem areas and take corrective action quickly, thereby improving its service considerably. However, revising old programs and producing new ones at the same time unquestionably placed a strain on production facilities and personnel.

Despite its cautious expansion policy, El Salvador's ITV project developed even more slowly than its planners had forecast. Like its counterparts in other countries, the project's growth was interrupted by unexpected delays. A major cause of delay was the failure of the $1.9 million U. S. loan to receive approval in time to allow production facilities to expand at the anticipated rate. The loan money from the U.S. was to become available early in 1969, permitting the construction of a second studio in time for the 1970 school year. A series of postponements, brought on by the war between El Salvador and Honduras, prevented this schedule from being kept. When final authorization for the loan was obtained in October, 1970, the studio was effectively two years behind its original expansion timetable.

The ITV staff adapted quite well to the strain of having to confine all its activities to one studio. In 1970, the second year of broadcasting, all the original seventh grade programs of the previous year were revised, and five new eighth grade series were added as planned to the production schedule. In 1971, five more series of ninth grade subjects were produced for the first time, and a substantial number of seventh and eighth grade programs were redone. By adopting a taping schedule which kept the single ITV studio operating twelve hours a day, and by leasing the transmission facilities of two commercial channels, the production teams were able to meet their deadlines, and service to the three secondary grades was provided on schedule.

When the Ministry of Education concluded that the costs of constructing an entirely new studio complex would not be much more expensive than expanding the existing facilities at the San Andres Normal School, the decision was taken to move the whole ITV operation to Santa Tecla, a site closer to San Salvador. The ITV facility was transferred and transmission facilities for two new channels were inaugurated in the following year.

The Problem of Producing High Quality Lessons

Owing to the handicaps cited above, the first three years of school broadcasting were quite frantic. Of growing concern to ITV's administrators during this period was the uneven quality of the televised lessons and the resulting complaints of classroom teachers. The lesson learned from this situation was that more time was needed to train people and to test and revise as many programs as possible. This would have required more studio facilities than the Salvadoran system had for the first three years, and, more important, some notion of what constituted program quality and effectiveness. Unfortunately, clear program objectives and production standards were absent in the early years and much had to be sacrificed just to get the programs made on schedule and on the air. However, the inauguration of the Santa Tecla production complex relieved pressure and permitted the revamping of taping schedules to provide more flexibility and experimentation in the studio. Important changes also occurred in the way lessons were designed. Beginning in 1972, the fourth year of broadcasting, ITV lessons were predicated on a taxonomy of learning outcomes and each program and teacher's guide was built around specific behavioral objectives.

The Integration of ITV with Other Educational Reforms

El Salvador's experience suggests that the introduction of television is best considered in terms of a nation's entire educational system. ITV was not simply imposed over existing programs and structures in El Salvador; rather, an effort was made to reexamine broad system needs and fit television to those needs. Early in this process it was discovered that no element of the traditional educational system could remain static if broad reform goals were to be achieved.

The swift, across the board nature of the Reform required classroom teachers and even some Ministry of Education officials to implement policies they had not made and often did not fully comprehend. Cooperation was not forthcoming from those who regarded the television as an expensive and unnecessary frill that exerted too much pressure on other areas of the educational system. The Ministry's curriculum writers, for instance, balked at the notion of reforming the existing study programs simply because there was an urgent need for them at the television center. Likewise, Minister Beneke's dramatic closing of the country's primary teacher training institutions heightened resentment, although the resulting reduction in teacher unemployment and the high quality of the retraining program eventually mollified teacher suspicions. Even so, graduates of the Superior Normal School, who sensed correctly that their privileged status had been undermined by television and the new retraining programs, remained unaccepting.

Perhaps the most nagging problem was the effort to transform the school supervisors from inspectors to counselors. The supervisors were not prepared adequately for the new role and many feared a loss of authority and prestige. Various factions in the Ministry of Education also opposed this reform because at first they did not have control over it (a new supervision corps had been established within the ETV

Division) and because they viewed the ITV leaders' interest in the matter as a threat to their own authority. Although these misunderstandings were worked out over time, the new concept of supervision was only partially accepted.

At the local level, classroom teachers were initially receptive to ITV and most of the other Reform measures but, as Chapter VI revealed, their enthusiasm waned over time. In retrospect, it appears that the Reform exacerbated the teachers' frustrations and left them with the impression that television had been purchased at the expense of improvements in their own salaries and working conditions. As the teachers' consciousness grew, so, too, did the strength of their union, ANDES. Curiously, the union's protests were directed at Minister Beneke personally and only indirectly at his Reform programs. In 1971, ANDES mounted its second nationwide strike in three years, paralyzing the school system for two full months. It was clear to the Reform's leaders that the success of future innovations would be contingent upon more attention being paid to teachers' rights and grievances.

Maintaining National Initiative and Control

Unlike other nations which depended heavily upon foreign experts to set up and administer new instructional television systems, El Salvador's leaders insisted that local people bear major responsibility from the start. The determination which characterized the original ETV Commission under Lic. Beneke was followed by the establishment of an

ETV Division within the Ministry of Education and not, as some had originally proposed, within a new executive agency under the president. Beneke demanded that Salvadoran educators control all phases of the Reform, including television. Accordingly, Ministry of Education officials were credited with the Reform's successes and held strictly accountable for its problems. In some instances, there were difficulties in adjusting to television and to the other innovations that accompanied it, but this seems a relatively small price to have paid for maintaining the Reform's national character.

A crucial factor in the development of El Salvador's ITV system was the support it received from the highest levels of government. President Fidel Sanchez Hernandez made the Educational Reform the prime program of his administration, and that priority, coupled with the fact that Salvadoran presidents are limited constitutionally to one, five-year term meant that the ITV system had to be designed and implemented quickly to gain political visibility and approval.

The difficult job of putting President Sanchez Hernandez' mandate into action was given to Lic. Beneke. As chairman of the ETV Commission and later as Minister of Education, Beneke was relentless in his commitment to upgrade all aspects of El Salvador's educational system. Using ITV as a pacesetter for a wide range of changes, the Minister was personally involved in the day to day progress of each one of his reforms. Whether the Educational Reform in El Salvador would have taken place without Walter Beneke cannot, of course, be answered; but it is doubtful that the changes could have come as fast without so forceful a leader.

The importance of strong leadership and high level support, however, illuminated the general problem of instutitionalizing change in organizations as resistant to innovation as national school systems or ministries of education. The institutionalization of the Salvadoran Reforms may have been slowed somewhat by the very force of Beneke's leadership. By entering directly into many of the day to day decisions and problems of his divisions, the Minister challenged his chief subordinates continually. Most division leaders were, in fact, dependent on the Minister's judgment and reluctant to act on matters without his approval. This tendency impeded problem-solving at lower administrative levels and retarded communication and cooperation between divisions. Again, however, it is not possible to determine whether or not these problems, which were deeply rooted in the bureaucracy of El Salvador's Ministry of Education, would have been any less troublesome had some other person been minister.

When Beneke was appointed Minister of Foreign Relations in September, 1971, his former deputy, Lic. Antonia Portillo de Galindo, was named Minister of Education. Lic. Galindo faithfully carried through with the programs that had been started under Beneke's administration. Following the election of Coronel Arturo Armando Molina as President of El Salvador in March, 1972, Dr. Rogelio Sanchez was appointed Minister of Education. As a former teacher and a man sensitive to political trends in his country, Dr. Sanchez adopted a conciliatory posture toward the classroom teachers and tried to heal the lingering wounds from their strike the previous year. At the same time, the new minister reinforced the numerous changes that had been instituted by his predecessors and moved to consolidate the Educational Reform through the strengthening of a new planning office and the preparation of a second and equally comprehensive five-year plan.

The Role of Foreign Advisers

While adhering to the principle of local control in all areas of their Reform, the Salvadorans received technical assistance from some 60 foreign advisers representing more than a half a dozen countries and various international agencies. The advisers were instrumental in getting the reform programs underway, but their contributions varied markedly. Despite the intentions of Ministry leaders and their counterparts in the aid agencies, the effectiveness of far too many foreign advisers remained a matter of chance. Some of the most professionally qualified individuals with experience in other countries faired poorly, while other, less experienced persons made major contributions to the development of one or more of the Reform programs.

In reviewing the difficulties encountered by foreign advisers in El Salvador, one lesson emerges clearly: the better defined an adviser's job, the more likely he was to be successful. That lesson was reflected in the contributions made by the advisers who worked in the ITV system and in the teacher retraining program as opposed to those who worked in the more culturally and politically sensitive areas of curriculum reform and school supervision.

Of course, an adviser's job could not be specified in any detail until a particular need had been identified by the Salvadoran government and this task was not handled adequately in the early years of the Reform. Thus, Ministry officials agreed to accept foreign assistance in many areas without really understanding its necessity or rationale. The burden of defining technical assistance needs often fell upon the aid agencies, principally USAID, which specified job requirements and recruited personnel, and because the bulk of the foreign advisers were paid for out of grant funds, the Salvadorans rarely challenged the aid agencies' judgments or the appropriateness of the advisors who were eventually recruited.

In most instances, the advisers themselves had to define their own jobs and, in a sense, legitimize their presence in El Salvador. To this end, the ability to communicate well in Spanish was essential and advisers who spoke fluent Spanish had a definite advantage. Empathy with Salvadorans and their culture as well as flexibility in the exercise of one's job, two highly intangible qualities, also proved to be traits that distinguished the more successful advisers. Technical expertise and experience, while important recruitment criteria, did not seem to weigh as much as the advisers' ability to work well with Salvadorans.

A revealing and rather hard assessment of foreign technical assistance was rendered by the Salvadoran government in 1972 when funds from USAID's $1.9 million loan became available and the financial support of foreign advisers passed directly into Salvadoran hands for the first time. At this point, the Salvadoran government balked at the notion of spending its own money to support foreign advisers, especially North Americans, who customarily commanded large salaries, cost of living allowances, and other benefits. For the first time, the cost-effectiveness of the technical assistance program was questioned by Ministry planners who believed that their money might better be spent on new school buildings or additional television receivers. Eventually, the Salvadoran government agreed to recruit additional foreign advisers, but it had made the point that such assistance would be more critically evaluated than in the past.

Another form of technical assistance involved sending Salvadorans abroad for specialized training. In the first five years of the Reform, more than 30 Salvadorans took advantage of such opportunities. The training programs were sponsored by a number of international agencies and foundations and they ranged from short seminars in neighboring Guatemala to full year scholarships in Europe and the United States. The value of such training experiences was hard to measure, both for the recipients themselves and for the groups that sponsored them. Benefits seemed to vary according to the applicability of the training experience to specific reform needs and to the capabilities of the participants. The majority of the trainees unquestionably profited from their experiences abroad but many doubted honestly that the programs had prepared them to do their jobs any better than they had done before.

The Evaluation and Revision of ITV's Objectives

As the Educational Reform progressed, the original problems of implementing and gaining acceptance for ITV receded and new concerns of coordination and quality control emerged. Accordingly, ITV's original role as Reform catalyst shifted subtly to one of consolidator and reinforcer of change. With the adoption of new curricula in grades seven through nine and the return of hundreds of retrained teachers to their classrooms, ITV helped to solidify change and to prevent slippage in the improved quality of classroom instruction. Yet, the pressures of setting so many reforms in motion and of producing so many television series had left little time for evaluation. Thus, in the fourth year of the Reform, attention focused for the first time on the role of research and feedback in the improvement of television's performance and the adjustment of television's goals.

The perceived need for better information from the field was coupled with some criticism of the Stanford research project and its summative evaluation of the ITV system. Complaints were raised that too little attention had been paid to other elements of the Reform and that the information gathered had not been particularly useful to Salvadoran decision-makers. Two steps were taken to correct these problems: a new evaluation unit was formed in the Ministry of Education to study all aspects of the Reform; and the ITV evaluation team, began to pay more attention to formative evaluation and feedback. Although the new Ministry unit was soon stalled because of inadequate staffing, ITV's evaluators made considerable progress in the pretesting of television lessons, the collecting of learning feedback from sample classrooms, and the general sensitizing of ITV personnel to the practical value of research data from the field. In time, the producers' fears of criticism receded in the wake of information which they deemed useful to the performance of their jobs.

At higher administrative levels within the Ministry of Education, questions arose concerning the future course of the Reform itself. The first five-year plan had demonstrated that many elements of the school system could be altered simultaneously, but the long range benefits of such changes were still in doubt. A positive relationship between Educational Reform and El Salvador's growth had been hypothesized at the outset of the five-year plan, but by 1972 the relationship was not so apparent. Furthermore, additional doubts had been expressed from abroad concerning the cost-effectiveness of the ITV system. Despite these questions, however, plans were made to extend learning opportunities outside school and to use television more extensively in primary education and teacher training. To observers within and outside the country, El Salvador appeared to be risking the quality of its existing programs by expanding into so many new areas at once.

The emergence of a new planning office within the Ministry of Education restored some faith that expansion priorities would be established in a realistic way. Although the planning office at first resisted USAID's suggestion that a thorough sector analysis precede any additional capital assistance, the idea was eventually accepted and, for the first time, collaboration with other ministries was sought to help define an educational program that would be in accord with El Salvador's over-all development goals.

Summary and Implications

All instructional television projects have had serious administrative problems. The administrative history of the El Salvador project was thus an important concern of the evaluation. Its goal was to record how decision-makers recognized and resolved problems during the first four years. The data for the study came from four main sources: published documents from the Ministry of Education, documents from USAID's education division, participant observation by evaluators over four years, and a series of in-depth interviews of Salvadoran leaders and their foreign technical assistants involved in the ITV system.

The major conclusions of the research on administration were as follows:

1. Management of the ITV system: The job of coordinating a highly complex ITV system was a major management effort for Salvadorans who had relatively little prior experience to guide them. The decision to inaugurate a system without sufficiently trained manpower caused early production efforts to be of uneven quality but, at the same time, encouraged a spirit of self-reliance not often found in such projects. Despite the delay of a crucial loan to expand production facilities, the project managed to utilize a single studio for the first three years of programming, and although the project was able to expand on schedule, the frantic pace maintained the first three years undermined program quality.

2. Integration of ITV with other reform changes: Because ITV demanded changes from other parts of the educational system, it was resisted by some Ministry officials, teachers, and supervisors. However, as ITV was integrated more fully into the school system, resistance to the new medium declined sharply.

3. Maintaining national initiative and control: El Salvador's vigorous minister of education made a great deal of difference to the success of the project. With presidential backing, Minister Beneke inaugurated an extraordinary number of changes in education during his four-year tenure. Subsequent ministers devoted their efforts to consolidating the changes that were begun during Beneke's administration.

4. The role of foreign advisors: Despite national control of the ITV system from the beginning, approximately 60 foreign advisors worked on various aspects of the ITV project during the first four years. Their success was uneven and El Salvador registered some doubts about the technical assistance program when the time came for the Ministry of Education to pay for new advisors out of loan money. Although the assistance program continued, more Salvadoran control was exerted over the recruitment and assignment of foreign experts.

5. Evaluation and revision of objectives: As ITV passed from its role of catalyst of innovation to that of consolidator of change, new goals and objectives needed to be defined by decision makers. Evaluation shifted toward a more direct feedback function and the entire project focused on three new substantive areas beyond the Third Cycle:

primary ITV, teacher retraining, and adult, out-of-school education. A new planning office in the Ministry gave some assurance that new directions could be set without undermining the quality of existing programs.

Although large educational technology projects like those of El Salvador, Samoa, Colombia, and the Ivory Coast serve as models for future projects, their important administrative lessons are often not passed on to others in a coherent or complete way. Mistakes are thus repeated again and again. The goal of the administrative research was to summarize the first few years of El Salvador's ITV system in a way that would make the experience useful for other countries. What, then, did the Salvadoran experience suggest about how to administer a national ITV system?

Integration of ITV into the educational system: Educational television faces a dilemma: to remain outside the formal educational system and thereby risk having little impact on that system, or to be integrated into a system resistant to change and thereby dilute some innovative impact. The Niger and Colombia projects remained apart; Samoa, the Ivory Coast, and El Salvador were integrated. El Salvador managed to introduce ITV into an educational system at the moment when a number of other major changes were to be made. ITV at first met with resistance from educational bureaucrats, supervisors and teachers, yet because of coordinated planning, it eventually became an integral part of the educational system.

Leadership and national initiative: It is a truism that significant changes demand capable leaders to bring them about. No major ITV project has lacked its leader, some person dedicated to the far-reaching application of technology to solve long standing educational problems. In some cases, such leaders were from outside the culture. If leadership comes from outside, there is likely to be a much greater problem of institutionalizing the technology once external aid and pressure are withdrawn. El Salvador had the double advantage of a strong leader who became minister of education at a time when widespread change was needed. Technology cannot successfully be introduced in a country unless there is local leadership to direct it, and in El Salvador it was the local leadership who saw technology as an important tool of change.

Ability to plan for change: No project can succeed without adequate planning, but most developing countries lack adequate planning as they begin television projects. The particular dilemma that Salvadoran leaders confronted was whether to begin when political backing made change possible or to wait until careful planning could be carried out. The decision to go ahead was balanced against a willingness to remain flexible in the early years, and such flexibility permitted the ITV project to adapt to changing problems and needs.

Quality of ITV programs: El Salvador's television programs were not of a high technical standard during the first years of the project due to the lack of trained people and the pressure of broadcast deadlines. Quality criteria and controls were never adequately defined, however, and this fact made the job of evaluation much more difficult. Very few projects have, in fact, attempted to define quality standards and this has often led to a lack of understanding and confusion over basic objectives.

Foreign advisers: The quality of help a country gets to begin a major ITV project can have major consequences on its success. Ideally, countries should be able to take care of all their own needs, but given the situation in most developing countries, some financial and technical assistance is often necessary. El Salvador benefitted from the help of many talented foreign advisers, but it also had the advantage of strong local leadership to prevent being dominated by them. Yet, over the first four or five years, it was not able to absorb much of the technical assistance it received and an effective way for organizing and evaluating such help was not adequately defined.

Chapter IX

Looking Ahead

By the end of 1972, four years after El Salvador's Educational Reform began, two cohorts of students had completed the Third Cycle of Basic Education (grades seven through nine) with television. Their graduation marked the end of the first phase of ITV's development and the end of the first five-year educational plan (1968-1972). With an additional studio and two new transmitters in operation, the Ministry of Education had expanded the ITV system to virtually all seventh, eighth, and ninth grade students enrolled in El Salvador's public schools. In addition, most private school students at this level were also receiving televised instruction.

As the 1973 school year began, three new projects were inaugurated on a pilot basis:

(1) the extension of ITV into primary school, beginning with the fourth grade;

(2) the expanded use of ITV in primary teacher retraining;

(3) the use of ITV in non-formal adult education.

Given the accomplishments of the first four years, what general conclusions can be drawn from El Salvador's experience with ITV, and how applicable are such conclusions to other countries?

El Salvador's Educational Reform, and particularly its ITV system, accomplished what they were expected to do under the original five-year plan. The bottleneck in secondary education was opened and with each passing year more students poured into the seventh grade. A greater percentage of these students were from disadvantaged backgrounds and most were expected to complete the ninth grade. Largely because of ITV, the great expansion in enrollment did not lead to a decline in learning. In fact, just the opposite occurred; students learned more under the Reform with ITV than they did under the traditional system.

Although ITV was unquestionably an expensive innovation for El Salvador, the Ministry of Education managed to offset some of its cost by increasing both classroom teachers' hours and class size. Given the projected rise in enrollments, the per student costs of instruction under the Reform with ITV will eventually be less than if the Reform had been introduced with traditional class size and teacher loads.

More students, better learning, and equal or lower per student costs: these are notable and impressive results. How did El Salvador achieve them when so many other countries have failed or fallen short in their efforts to introduce ITV?

The Salvadoran experience underscores the idea that ITV or any other instructional technology is best conceived in terms of broad system needs. ITV was not imposed over traditional structures; rather, it was coordinated with other major changes in El Salvador's educational system. In the midst of many other educational changes and innovations, ITV's contribution was not singled out by the Ministry's planners who correctly perceived the Reform as a system change and not just a television project.

Nevertheless, ITV also played a catalytic role in the Reform because it magnified the need for change in numerous areas. When the government decided to invest in television, it made sense to revise the curriculum so that the broadcast lessons would carry the most modern knowledge and teaching methods. Similarly, when El Salvador introduced ITV in the classroom, something had to be done to prepare the classroom teacher. Consequently, a major teacher retraining program was organized and so on for the reforms in supervision and evaluation and the provision of new materials for both teachers and students. Not all of these changes were successful, but such changes do not come easily in national school systems or ministries of education.

For the catalytic effect to occur, ITV needed the strong leadership of Lic. Walter Beneke. As Minister of Education, Beneke made sure that Salvadorans led all aspects of the Reform and he had no tolerance for bureaucratic delay. He angered teachers who felt some reforms were developed at their expense and who waged two national strikes in less than three years. However, Beneke was uncompromising and the teachers begrudgingly accepted most of his innovations, if not his way of implementing them.

By virtue of its national origins, its reform context, its strong leadership, and its ability to overcome difficult administrative problems, the outlook for the continuation and expansion of ITV is better in El Salvador than in other countries which have relied on imported models and experts to develop their systems for them. On the other hand, El Salvador's use of ITV may not be the best road for other countries to follow.

The appropriateness of the Salvadoran model to other countries depends both on their estimates of ITV's potential usefulness and on the importance they place on formal education. No matter how well planned and executed an educational reform may be, if it does not respond to a society's real economic and social needs and possibilities, the benefits to that society will be circumscribed. In evaluating the Salvadoran experiment, one must ask if the social and economic benefits El Salvador sought were realistic and whether they are the same returns other countries seek.

In its planning documents, El Salvador emphasized the need for more middle level manpower and through the Educational Reform it hoped to prepare more young people for technical jobs in industry and agriculture. Yet, in 1972, there were relatively few technical jobs for Third Cycle graduates and students were inclined to stay in school rather than enter the job market. If the country's high unemployment rate continues and there is no economic expansion to match the large increases in school enrollments, students may be forced to reconsider the kinds of middle level jobs they currently consider unsuitable. However, as the demand for employment increases, the jobs themselves may be reevaluated vis-a-vis the academic credentials necessary to hold them, and over time all but the lowest level positions may be held by ninth grade graduates.

While conceding that employment is likely to be a problem for Third Cycle graduates in the immediate future, Salvadoran planners believe that in the long run the economy will expand sufficiently to absorb them. By investing in education, they feel El Salvador will create a labor pool of adequate size and quality to attract foreign investment which, in turn, will create new technical jobs. This expectation may or may not be fulfilled. In any case, planners from other countries must question whether or not such premises are adequate justification for investing in television and educational reform.

The rationale for mounting such a comprehensive educational reform in El Salvador was not limited to the economic argument that it would help generate more jobs. The government had strong political and moral justifications. Above all, they believed that nine years of basic education should be the right of every child, regardless of the costs of such a policy to the society as a whole.

In spite of the democratic ideals that inspired the Reform and increased educational opportunity, the impact of ITV was relatively small in view of the large number of children and adults who had no contact with the school system. The introduction of ITV and the other reforms may not have increased per student costs, but the increase in enrollment required a massive investment of scarce resources. In 1972, the Ministry of Education consumed 36.6 percent of the national budget. Such a concentration of resources bespoke a tremendous confidence in the current generation of students to solve El Salvador's problems and, at least tacitly, a lack of faith in older generations or other public sectors to do so. In Minister Beneke's words:

> This generation is not going to build Latin America.
> They are going to do it, the next one, or the one after that.
> And they will do it much better.

Other countries, burdened by economic problems and pressures for social change similar to those of El Salvador and wishing to emulate the latter's successful application of ITV, may not be willing to allocate their educational resources exclusively to formal education. Indeed, in the last year El Salvador has also turned its attention for the first time to the needs of its large out of school population. How El Salvador will use its ITV system to meet the diverse educational needs of this group remains to be seen.

In El Salvador and elsewhere, new strategies are needed to expand educational opportunities through the use of television and other instructional technologies. What promising trends have become apparent in recent years?

Parallel schools: This strategy customarily relies on radio or television to carry the main instructional burden and substitutes less trained classroom monitors for specialized teachers to provide essentially the same curriculum offered in regular schools. Printed materials and supervisory personnel are often added to enhance student learning and to maintain academic standards at the local level. Such a strategy has clear advantages for rural areas which often lack regular schools; it increases educational opportunity; it saves on teacher, building, and administrative costs; and it involves local communities in the creation and maintenance of their own schools. However, unless this strategy is supported by the educational establishment and unless its students are accorded the same status and degrees as other students, it may come be regarded as a second rate substitute for traditional schooling. Also, because such a strategy relies heavily on the initiative and support of rural communities, it may challenge the urban investment priority of most ministries of education. Thus if local initiative for local schools exists, governements may eventually be forced to support them on the same basis as traditional urban schools.

Open schools: The success of the British Open University has focused attention in recent years on the open school strategy. This strategy is one step further removed from the traditional school for it abolishes the normal classroom. It places the burden of instruction on the student himself and enables him to work on his own in regions where there are no schools. Open school systems have characteristically evolved toward a multi-media teaching approach, using the mass media in combination with carefully planned printed materials, face to face tutorial sessions, and periodic vacation courses or workshops. Various countries are now experimenting with such a strategy because it promises to increase educational opportunity for people who because of age, occupation, physical isolation, or lack of academic qualifications cannot attend regular schools and it can provide such opportunity in ways that are far less costly than either the traditional school or the parallel school strategy described above.

The main drawbacks of the open school strategy are the isolation of the students, the lack of incentive to keep up with the lessons, and the resulting high dropout rate. These limitations are especially severe in the rural areas of developing countries where potential students lack adequate preparation and the study habits needed to follow courses on their own.

Beyond the school: Beyond the school are learning needs that are not related to formal degrees or certification, but that are of vital interest to large numbers of people in different countries. They include technical training, health and child care, agricultural innovations, and family planning. The media have been used extensively to provide information and learning opportunities to change attitudes and to mobilize people in these areas. Successful projects of this kind have used the media in combination with printed materials, feedback mechanisms, and field workers. In concert, these elements have enhanced the media's impact in nonformal education just as the revised curriculum, teacher retraining, and new student workbooks were instrumental to the success of classroom television in El Salvador.

Each of these strategies can help solve educational problems as different countries become aware of them. Most planners realize, however, that education alone will not solve deeply rooted economic and social problems and that modern technology is no substitute for basic reform. Within that context, the El Salvador experience with ITV does illuminate an important role for media in resolving some of the pressing educational problems of the developing world.

APPENDICES

A. Notes on the Evaluation Design

B. Chronology of the Educational Reform in El Salvador

C. Sample Research Instruments

D. Extra Tables

E. List of Publications from this Project

Appendix A

Notes on the Evaluation Design

In designing the evaluation of an ongoing project, one is always torn between the desire to maintain proper scientific rigor and the limitations imposed by the need to work in a field situation with inevitable political and logistical constraints. Ideally, the researcher would like to compare several instructional alternatives (ITV with face-to-face teaching, ITV with radio, ITV with computer-managed instruction, etc.). In El Salvador, however, the important decision to use television had been made before the arrival of the evaluators and there was little interest on the part of Salvadoran decision makers in experimenting with other technologies or instructional strategies.

Ideally, the researcher would also like to assign students, teachers and instructional conditions randomly throughout the school system. But a school system is not a laboratory, and experimental control was not a high priority for Salvadoran administrators who were trying to deal with a major educational reform. While the researchers would have preferred to vary one element of the Reform at a time, in order to isolate the effect of ITV from other Reform elements, the political necessity of introducing the Reform as a package outweighed that preference.

Finally, within the researcher's ideal paradigm, all physical and political characteristics of the population under study should be identical to the physical and political characteristics of every other population to which he wishes to generalize his findings. El Salvador, like any other country, is unique in many respects. The concentration of the population in a limited geographical area, the centralized control of the entire educational system and especially the strong leadership of the first Minister of Education limit the generalizations about ITV or about educational reform that one can draw from the Salvadoran experience.

An Attempted Field Experiment

The evaluation team tried to set up a field experiment in 1969 and again in 1970, randomly dividing students from a few schools between classrooms with ITV and the other reform elements and classrooms with all the elements of the Reform but without ITV. In the 1969 effort, failure of the randomization procedure undermined the validity of the experiment while administrative difficulties affected the comparisons in 1970. However, the most damaging limitation of these experiments was their lack of true control. Teachers often taught in both the ITV and non-ITV classes in a given school. Thus, the teacher's own ability probably accounted for learning similarities between the two classes.

The teacher also served as a mediator of an effect of television on the non-ITV class. Certainly the planners of the Educational Reform expected that one of ITV's major effects on students would be indirect, as teachers improved their own teaching both by following the structure imposed by the ITV program schedule and by using the television teachers as pedagogical models. In addition, because non-ITV classes were in schools where there was ITV, children from ITV classes and non-ITV classes no doubt did their homework together and probably reviewed for tests together. Certainly systems theorists have taught us that the system as a whole must be examined if its functioning is to be fully understood. In this case, the school as a whole was much affected by the presence of ITV whether every class received ITV programs or not. Thus, even if random assignment had been successful, and administrative difficulties non-existent, assessment of the effects of ITV through comparison of classes within the same school would be questionable. For all these reasons, the experiment failed and was not reported in this document.

With the failure of the experiment, a less rigorous design was adopted.

Comparison Groups

The first sample of 902 students (which we will call Cohort A) entered the seventh grade in 1969. Of the 38 classrooms, 25 were completely under the Reform: they had retrained teachers, new curricula, teacher's guides and students' workbooks as well as ITV. Four classrooms were controls from the field experiment described above, and they have been left out of all analyses comparing instructional conditions. The nine remaining classrooms were traditional in the sense that they had none of the above-mentioned components of the Reform.

There were also some curriculum differences between the Reform (ITV) sample and the traditional sample. To control for this, in 1969 the groups were compared only on achievement test questions that were common to both old and new curricula.

The Cohort A classrooms with ITV had been chosen by the Ministry of Education and were not a random sample from the school population. The traditional schools were randomly selected by the researchers from the remaining public schools in the TV coverage area (about 75 percent of the national territory). Both samples contained students from rural and urban schools.

A sample of 707 students in 29 classrooms that entered seventh grade in 1970 formed Cohort B. Because virtually all elements of the Reform were in place by 1970, the difference between instructional groups was the presence or absence of television. Thus, in 1970, the sample included 18 Reform classes with ITV and 11 Reform classes without ITV. Six of the Reform classrooms without ITV originally served as control groups from the unsuccessful experiment. The others were selected from classrooms which for one reason or another remained without ITV in 1970.

Cohort C (1971 seventh grade entrants) included 23 Reform classrooms: 18 classes with ITV and five classes without ITV. The ITV classrooms were selected randomly from the schools in the Cohort A and Cohort B ITV samples. The five non-ITV classrooms were from the non-ITV schools in Cohort B. Altogether 600 students were included in this sample.

To be included in the final samples for Cohorts A, B, and C, students had to have taken most of the learning tests and survey questionnaires and remained in the same class for the two (Cohort C) or three years they were in school (Cohorts A and B). These requirements reduced considerably the number of students within the final samples. Several classrooms originally included in the cohorts were also eliminated for administrative reasons.

Some final technical points are in order. One concerns the problem of sampling and sample representativeness. Wherever possible, the samples analyzed in the present study were drawn randomly, but this was not always possible. In 1969, the pilot ITV classes were selected by the Ministry of Education, while Traditional classes were randomly selected by the research team from schools within the TV coverage area (about 75 percent of the country). Comparing the ITV with Traditional students in that year, there was a close matching of the two groups on major demographic and background variables and close pre-test scores on achievement. In 1970, greater possibility for random selection gave Cohort B Reform classrooms with ITV more generalizability to the populations from which they were drawn (again within the coverage area), but the Reform without ITV sample had to be taken from available schools. In each analysis, there has been a concerted effort to seek out and control for any bias leant by non-equivalent instructional samples. It is clear, however, that perfect control was not achieved. Such imperfection is an almost inevitable result of research in a field situation.

Among the most valuable tools that enables social science to deal with such limitations is the collection of panel data (following the same individuals over a long time) and the application of appropriate analysis models. Panel data allow a much more thorough examination of the effects of ITV on a school system than has been possible before. Ordinarily, TV experiments have relied on limited populations with brief exposures to the media and no measure of longer term results (Chu and Schramm, 1968; Jamison, Suppes and Wells, 1973). Surveys have measured broader populations but usually at only one time. The El Salvador research has followed two samples over three years and one sample over two years. This allowed certain kinds of analysis not ordinarily possible. Moreover, long term findings within three cohorts permitted not only comparisons between ITV and non-ITV groups, but also two replications of these comparisons. Thus, patterns in learning were examined over eight school years (three each for Cohorts A and B, two for Cohort C) and, as a result, inferences from them are more valid than inferences based on measures from a single year.

References

Chu, G. and Schramm, W. Learning from Television. Washington, D.C. National Association of Educational Broadcasters, 1967.

Jamison, D., Suppes,P. and Wells, S. The Effectiveness of Alternative Instructional Media: A Survey. Stanford: Institute for Communication Research, March, 1973.

APPENDIX B

Chronology of Educational Reform in El Salvador

1960 -- Possibility of introducing ITV is discussed in El Salvador newspapers.

1962 -- Survey by Japan Broadcasting Corporation engineers is arranged by Walter Beneke, Salvadoran Ambassador to Japan. Survey team recommends a national system of ITV.

1963 -- President Rivera establishes an Educational Television Commission to recommend a national plan for ITV by 1964, but progress drags. Some young Salvadorans are sent to Japan for a year of engineering training, but they have no ITV jobs when they return.

1964 -- Department of Educational Television is created within Ministry of Education, but for two years this Department has no leader and no budget.

1965 -- Educational Television Commission is revitalized when Lic. Beneke returns from ambassadorial post in Japan, and is appointed chairman of the Commission. Key new appointments are made, and the Commission begins to hold weekly meetings. Commission studies experience of other countries with ITV, and makes statistical analysis of educational system.

1966 -- Commission decides that ITV should be introduced first into the seventh, eighth, and ninth grades (Plan Basico), and recommends that it be organized as an autonomous institution reporting directly to the President, rather than within Ministry of Education.

1967 -- Small program of experimental production is begun using rented facilities of commercial TV station.

(Spring) -- President Fidel Sánchez Hernández hears President Lyndon B. Johnson speak at Punta del Este of possibility of financing pilot project in ITV somewhere in Latin America, and puts El Salvador's case before U.S. officials. AID sponsors a survey team recruited by National Association of Educational Broadcasters, which recommends a favorable response to El Salvador's proposal. The team, however, pushes for a large project at primary

1967 (continued) school level. Salvadorans resist this latter recommendation, and eventually prevail.

(July) -- Lic. Beneke is named Minister of Education, and opposition to placing ITV in the Ministry evaporates.

(Summer) -- Formal proposal is submitted by Salvadoran government to USAID.

1968

(Spring) -- Formal project agreement is signed between El Salvador and USAID. Latter agrees to contribute $653,000 to start-up costs of project -- largely studio and transmission equipment, graphic arts equipment and printing machinery, and 100 television receivers.

-- A U.S. loan of $1.9 million is planned to back up this AID contribution, and make it possible for El Salvador to construct and provide new studio and transmission facilities, and receivers to cover almost entire country.

-- Minister Beneke closes most of the normal schools, which had been over-producing primary teachers, and establishes a new centralized normal school at abandoned campus in San Andres.

(September) -- Temporary studio is equipped in building at San Andres.

-- ITV staff (total of 20 in spring of 1968, 200 at end of 1971) is recruited and inservice training begun.

-- USAID supplies first group of advisers in production, graphics, film, curricular revision, printing, utilization, evaluation.

(November) -- Tentative revision of seventh grade curriculum is completed and given to ITV production teams and instructors at San Andres.

-- Production teams have three months to make classroom materials, teachers guides, and TV programs.

-- Normal school faculty have three months in which to retrain 100 teachers for pilot ITV classrooms, and 12 candidates for positions as utilization supervisors.

1969

(February) -- New curriculum and ITV begins in 32 pilot 7th grade classes.

1969 (continued)	-- Nine months retraining program begins for 250 *Plan Basico* teachers.
(July)	-- War breaks out between El Salvador and Honduras. USAID funds to both countries frozen.
1970	-- AID freeze on funds to El Salvador is lifted.
(February)	-- New curriculum is installed in all 7th grade classes with ITV in 219 of 400 classrooms.
	-- 32 pilot 8th grade classes begin with new curriculum and ITV programs.
	-- Second group of 250 *Plan Basico* teachers begin 9 months retraining program.
(October)	-- Salvadoran National Assembly gives final authorization for loan from AID to finance new studio and transmission facilities.
1971 (February)	-- Ministry of Education is reorganized with *Plan Basico* revamped and renamed Third Cycle of Basic Education.
	-- System of oriented promotion is introduced whereby almost all students will pass. Testing and evaluation are modernized.
	-- Tuition is eliminated for the Third Cycle of Basic Education opening up 7th grade to all qualified graduates of Second Cycle. Results in overcrowding of classroom and heavy teaching loads.
	-- New curriculum and ITV extended as widely as possible in 7th and 8th grades.
	-- 32 9th grade classes begin using ITV.
	-- Retraining program begins for third group of 200 Third Cycle teachers.
	-- New curriculum introduced in first six grades. Primary teachers participate in week-long crash retraining program via ITV. Thereafter retraining programs continue via ITV on Saturday mornings.
	-- Six month retraining program begins for school directors.

1971
(continued)
(July) -- Teachers strike for higher pay and/or reduction in workloads. Most schools greatly disorganized. ITV broadcasts previously taped lessons to 7th and 8th grade classes which remain in session. 9th grade ITV goes off the air for the remainder of the year.

(September) -- Teachers strike settled but many schools still disorganized on account of teacher transfers.

-- Minister of Education Beneke resigns and is named Minister of Foreign Affairs. Licenciada Antonia Portillo de Galindo appointed in his place.

1972
(January-February) -- ITV programs revised to reflect revised curriculum, printed materials and the use of behavioral objectives.

(February) -- New studios at Santa Tecla opened.

-- Reform and ITV extended throughout Third Cycle

-- 230 Third Cycle teachers enter retraining.

(July) -- New Minister of Education, Sr. Rogelio Sanchez, appointed, as a new government takes office.

-- New Five-Year Plan provides for introduction of television into Second Cycle, and for its extensive use in adult education and retraining teachers.

-- ITV personnel receive extensive retraining on the use of behavioral objectives, formative evaluation and qualitative aspects of improving programming -- under auspices of Stanford research team and Ministry official:

1973 -- New government TV channels and production studio officially inaugurated.

APPENDIX C

Sample Research Instruments

1. Example of a Student Questionnaire
2. Example of a General Teacher Questionnaire
3. Teleseries Feedback Questionnaire
4. Teacher Observation Form
5. Community Survey

The student and teacher questionnaires reproduced here are examples of the instruments that were used. However, a number of different versions of each were used during the course of the evaluation.

EXAMPLE OF A STUDENT SURVEY*

Full Name____

Name of School____

Grade______________   Section_________________

INSTRUCTIONS: THIS IS NOT A TEST. THERE ARE NO CORRECT OR INCORRECT ANSWERS. WHAT COUNTS IS YOUR OWN OPINION. PLEASE ANSWER WITH SINCERITY.

Each one of the following questions has one or more answers. Put an "X" in the blank that corresponds to your answer. In those cases for which you are asked to fill in information, do so in the appropriate space.

Section I: General

1. Age: _____Birthdays completed

2. Sex: Female_____
Male _____

3. Date of birth______________________________________
Day Month Year

4. Write the total number of people who live in your house (including yourself and servants, if there are any):

_____Total number

5. Of the following people, which ones live in your house?

_____mother
_____father
_____brothers and sisters
_____grandparents
_____other relatives
_____others who are not relatives

---

*Administered October, 1970

6. What is your father's occupation?_____________________________

7. What is your mother's occupation?_____________________________

8. Indicate your parents' level of education:

	Father	Mother
Didn't study	_____	_____
Part of primary	_____	_____
All of primary	_____	_____
Plan Basico	_____	_____
Commerical course	_____	_____
High school	_____	_____
University	_____	_____

9. How long does it take you to get to school every day?

Less than 15 minutes _____
Between 15 and 30 minutes _____
Between 30 minutes and an hour _____
More than an hour _____

Section II

10. Of the following information media, which do you have at home?

_____newspapers
_____magazines
_____radio
_____television
_____books

11. Outside of school, how many times did you watch television last week?

_____never
_____one or two times
_____three or four times
_____five or six times
_____every day

12. Approximately how long do you listen to the radio each day?

_____never
_____less than an hour each day
_____one or two hours each day
_____three or four hours each day
_____more than four hours each day

13. How frequently did you read newspapers last week?

_____never
_____one or two times
_____three or four times
_____five or six times
_____every day

14. How frequently did you read magazines last week?

_____never
_____one or two times
_____three or four times
_____more than four times

15. How many books did you read last year?

_____none
_____from 1 to 3
_____from 4 to 10
_____more than 10

16. How frequently did you go to the movies last month?

_____never
_____one or two times
_____three or four times
_____more than four times

17. Where do you usually see commercial television?

_____in your house
_____in a friend's house
_____in the house of relatives
_____in some other place

18. What is your favorite commercial television program?

____

19. What day or days is that program on?

____

20. How often do you see each one of the following programs?

	Every week	Once or Twice a month	Rarely	Never
A. Tarzan				
B. Tom Jones				
C. Oficina para todos				
D. Tierra de gigantes				

Section III

INSTRUCTIONS:

In this section you will find a series of statements. There are five possible answers for each statement that go from "Completely agree" to "Completely disagree." You should choose the answer that most closely approximates your own opinion and put an "X" on the corresponding line. Example:

Playing with a ball is lots of fun.

Completely agree	Agree	Undecided	Disagree	Completely disagree

Please answer the following statements that are about Educational Television. Remember we want to know your personal opinions.

21. You learn more during classes with television than during classes without television.

Completely agree	Agree	Undecided	Disagree	Completely disagree

22. Classes with television are more difficult.

23. The picture-quality on television is good.

__________ __________ __________ __________ __________

24. It is easier to understand classes with television than classes without television.

__________ __________ __________ __________ __________

25. Classes with television do not give one enough opportunity to express his opinions.

__________ __________ __________ __________ __________

26. My parents know a lot about the use of television in my school.

__________ __________ __________ __________ __________

27. It seems that classroom teachers prefer to teach with television.

__________ __________ __________ __________ __________

28. It is more difficult to ask questions in classes with television than in other classes.

__________ __________ __________ __________ __________

29. Classes with television are more enjoyable than classes without television.

__________ __________ __________ __________ __________

30. From which of the following situations do you learn most?

_____from my own study
_____from my courses with classroom teachers
_____from written work or group projects in class
_____from Educational Television programs

31. From which of the following situations do you learn least?

_____from my own study
_____from my courses with classroom teachers
_____from written work or group projects in class
_____from Educational Television programs

Section IV

32. Which subject do you most like to study?

_____Mathematics
_____Natural sciences
_____Social studies
_____English
_____Spanish
_____All of the above

33. Which subject do you least like to study?

_____Mathematics
_____Natural sciences
_____Social studies
_____English
_____Spanish
_____All of the above

34. How far do you intend to go in school?

_____Finish Plan Basico
_____Finish a career course, after Plan Basico
_____Finish high school
_____Finish the university
_____Specialize after graduating from the university

35. How sure are you that you will finish the studies you hope to complete?

_____I am certain I will not finish
_____I believe I will not finish
_____I may finish
_____I believe I will finish
_____I am certain I will finish

36. Of the following reasons, mark the most important one that you believe would not permit you to study as much as you want to:

_____studies will be too difficult
_____opposition of my parents
_____lack of money
_____lack of opportunity
_____other reasons
_____no reason

37. What level of studies do you consider necessary for the majority of the Salvadorean population?

_____Primary school
_____Plan Basico (Jr. High)
_____Short career
_____High school
_____University

38. Who is most concerned about your education?

_____father
_____mother
_____another relative
_____another person who is not a member of the family
_____no one

39. Which career would you most like to follow when you finish your studies?

____

40. The career noted by you in the previous question was chosen by you for which of the following reasons:

_____it pays a good salary
_____it is a respected career
_____that career is one that helps other people
_____it is a "short" career
_____you prefer it, but for no particular reason
_____other reasons

41. If for some reason you are unable to have the career you selected in Question 39, what kind of work will you probably do?

____

42. What career would your parents most like you to have?

____

43. How frequently do you talk to your parents about the careers you might have?

_____never
_____from time to time
_____frequently
_____very frequently

44. When you finish your studies, with whom would you like to work?

_____the government
_____a large company
_____a small company
_____on my own
_____with someone in my family

45. When you finish your studies and begin to work, where would you like to live?

_____in a small town
_____in a city other than San Salvador
_____in San Salvador
_____outside the country

46. When you finish your studies, would you be willing to live and work in a small town?

_____completely willing
_____more or less willing
_____more or less unwilling
_____completely unwilling

47. What monthly salary do you believe is necessary to live decently?

_____from 100 to 200 colones (1 colon equals $.40 U.S.)
_____from 200 to 300 colones
_____from 300 to 400 colones
_____from 400 to 500 colones
_____from 500 to 600 colones
_____more than 600 colones

48. Do you work in addition to attending school?

_____work for a salary outside of the home
_____work with parents or relatives and receive a salary
_____work only on household chores
_____do not work regularly

49. If at the end of Plan Basico you were to be offered a good paying job but one that would not permit you to continue your studies, would you take the job?

_____Yes
_____No
_____Undecided

50. What kinds of things do you like to do most in your spare time?

1. ____
2. ____
3. ____

Section V

51. How will life be for the majority of students in your class?

_____very similar to that of their parents
_____almost like that of their parents
_____generally different from that of their parents
_____very different from that of their parents

52. What is the best way to get ahead in a job?

_____to be intelligent
_____to work hard
_____to work a long time in the same place
_____to know how to work well with other people
_____to have friends or relatives who have influence

53. Consider each one of the following occupations and mark down whether you would be happy or unhappy to do that kind of work.

		Happy	Unhappy
A.	Bookkeeper	____	____
B.	Day-laborer	____	____
C.	Engineer	____	____
D.	Small farmer	____	____
E.	Brick-layer	____	____
F.	Doctor	____	____
G.	Industrial technician	____	____
H.	Chauffeur	____	____
I.	Lawyer	____	____
J.	Accountant	____	____
K.	Architect	____	____
L.	Electrician	____	____
M.	High school teacher	____	____
N.	Nurse	____	____
O.	Bilingual secretary	____	____
P.	Insurance agent	____	____
Q.	Primary school teacher	____	____
R.	Business manager	____	____
S.	Soldier	____	____

54. Getting a good education is worth the sacrifice of being away from one's family.

__________	__________	__________	__________	__________
Completely agree	Agree	Undecided	Disagree	Completely disagree

55. In general, it is better to accept a good job when it is offered, rather than continue one's education with the hope of getting a better job in the future.

__________ __________ __________ __________ __________

56. Did you ever have to repeat a grade?

_____yes
_____no

57. What career do you think is most important for the development of El Salvador?

____

EXAMPLE OF A CLASSROOM TEACHER SURVEY*

Section I: Educational Television (ETV)

1. Students learn more with ETV than without it.

Completely agree**	Agree	Undecided	Disagree	Completely disagree

2. It is more difficult to maintain classroom discipline when using ETV.

3. Classroom teachers improve their methods by watching the teleteacher.

4. ETV diminishes the importance of the classroom teacher.

5. ETV classes are an obstacle to the interpersonal relations between the classroom teacher and and his students.

6. Students learn to study better by themselves when they receive their classes by ETV.

7. Classroom teachers learn to organize their schedules better with the ETV system.

---

*Administered November, 1970

**All of these questions (1-27) have the same five alternatives.

8. There is a serious obstacle to learning by ETV because students cannot ask questions until the program has ended.

__________ __________ __________ __________ __________

9. It is possible to teach more with ETV during the year, because ETV can cover more material.

__________ __________ __________ __________ __________

10. Instruction by ETV makes the student more passive in class.

__________ __________ __________ __________ __________

11. The ETV schedule does not allow enough flexibility for the classroom teacher to teach his material.

__________ __________ __________ __________ __________

12. ETV helps parents become more interested in the education of their children.

__________ __________ __________ __________ __________

13. Instruction by ETV gives information, but it cannot transmit values.

__________ __________ __________ __________ __________

14. Students would learn more if they didn't have ETV.

__________ __________ __________ __________ __________

Section II: Teaching and Education

15. Teaching is not a profession that gives much satisfaction.

__________ __________ __________ __________ __________

16. All youngsters should have the opportunity to finish Plan Basico (Jr. High School).

__________ __________ __________ __________ __________

17. Increases in enrollment reduce the quality of secondary education.

__________ __________ __________ __________ __________

18. The fundamental goal of education is to form the character of the child.

__________ __________ __________ __________ __________

19. I would encourage my best students to become teachers.

__________ __________ __________ __________ __________

20. Only the best students should continue studying after primary school.

__________ __________ __________ __________ __________

21. In El Salvador, teachers are much respected.

__________ __________ __________ __________ __________

22. The majority of jr. high school students is not very interested in learning.

__________ __________ __________ __________ __________

23. I would remain in education even if I found another job with a better salary.

__________ __________ __________ __________ __________

24. Many students do not respect their teachers.

__________ __________ __________ __________ __________

25. The most important goal of education is to develop reasoning.

__________ __________ __________ __________ __________

26. The great majority of students is motivated to make good use of jr. high school education.

__________ __________ __________ __________ __________

27. The current Educational Reform is moving toward high quality jr. high school education.

__________ __________ __________ __________ __________

Section III: The Prestige of Occupations

28. Please indicate your idea of the prestige of each one of the following occupations (mark your answer with an "X" in the appropriate space).

	Very high	High	Average	Low	Very Low
A. Bookkeeper					
B. Day-laborer					
C. Engineer					
D. Small farmer					
E. Brick-layer					
F. Doctor					
G. Industrial technician					
H. Chauffeur					
I. Lawyer					
J. Accountant					
K. Architect					
L. Electrician					
M. High school teacher					
N. Nurse					
O. Bilingual secretary					
P. Insurance agent					
Q. Primary school teacher					
R. Business manager					
S. Soldier					

Section IV: Problems in Education

29. According to your personal experience, please indicate how you consider each of the following problems, answering with an "X".

Problems in the Classroom

A. Guides and workbooks don't arrive on time.

________	________	________	________
Very serious	Serious	Minor	Very minor

B. Lack of teaching materials.

________ ________ ________ ________

C. Too many students in class.

________ ________ ________ ________

D. Poverty of the students and their environment.

________ ________ ________ ________

E. The behavior of students.

________ ________ ________ ________

F. Technical problems in the reception of teleclasses.

________ ________ ________ ________

Problems in the Educational System

G. Lack of supervision.

________ ________ ________ ________

H. Lack of parents' cooperation.

________ ________ ________ ________

I. The economic situation of teachers.

________ ________ ________ ________

J. School administration.

__________ __________ __________ __________

K. The efficiency of the Ministry of Education.

__________ __________ __________ __________

L. Lack of teachers with a "vocation" for teaching.

__________ __________ __________ __________

M. Changes in the system of evaluation and promotion.

__________ __________ __________ __________

N. Method of appointing teachers.

__________ __________ __________ __________

Section V: Personal Data

30. Birthplace: City______________________________

Department of__________________________

Do you reside in the city where you teach? Yes___ No___

If you answered "No" above, where is your permanent residence?

City______________________________

Department of__________________________

Age_____ Sex: Male_____ Female_____

31. Mark in one of the following blanks how long you have been teaching with ETV:

First year I've taught with ETV _____
Second year I've taught with ETV _____
I don't teach with ETV _____

32. Mark in the blanks your classification as primary school teacher, if you have one, and for the other levels mark only those you have graduated from, except university.

Teacher classification:

_____Class B
_____Class A
_____High school
_____Accountant
_____Class A and High school
_____Class A and Accountant
_____High school and Accountant
_____Class A, High school and Accountant

Higher education:

_____No higher education
_____Superior Normal
_____1-2 years at the university
_____3 or more years at the university

33. Date when became a teacher _______________
Date when became a secondary teacher _______________

34. Mark with an "X" the subjects you teach.

_____Mathematics
_____Natural science
_____Social studies
_____Spanish
_____English

CLASSROOM TEACHERS' FEEDBACK SURVEY*

INSTRUCTIONS:

The following material refers only to the Math course at the grade level indicated. Please consider only this course when giving your answers.

For each of the following questions you should respond in the following manner:

If the statement is: "The ability of most students to learn Mathematics"

1 2 3 4 5

you should decide whether you think that ability is high or low. If you think it is very high, you should make a circle around the number "5". If you think it is very low, you should make the circle around the number "1". If the ability is mid way between high and low, "3" would be the appropriate number to circle. If it is high, but not very high, you should circle the number "4". If it is low, but not very low, you should circle the number "2".

Learning

1. What students learn from mathematics with ETV.

   1 2 3 4 5

2. What students learned from mathematics before the introduction of ETV.

   1 2 3 4 5

Motivation

3. The motivation of the students in mathematics since the introduction of ETV.

   1 2 3 4 5

4. The motivation of students in mathematics before the introduction of ETV.

   1 2 3 4 5

*Administered 1970-1972. Prepared according to the subject and grade taught

Guides for Teachers of Mathematics

5. The aid to teaching given by the guides of mathematics.

1 2 3 4 5

6. The practical value of classroom activities suggested by the guides for mathematics.

1 2 3 4 5

7. The relationship between the guides of mathematics and the teleclasses of mathematics

1 2 3 4 5

The Teleteacher of Mathematics

8. The teleteacher's knowledge of mathematics.

1 2 3 4 5

9. The teleteacher's ability to teach mathematics.

1 2 3 4 5

10. The teleteacher's ability to make students participate.

1 2 3 4 5

11. The teleteacher's ability to teach mathematics, in comparison with the majority of classroom teachers.

______	______	______	______	______
Much less	Less	Equal	Much more	More

Student Workbooks for Mathematics

12. The number of exercises generally included in the workbooks:

______	______	______	______	______
Very insufficient	A bit insufficient	Adequate	A bit excessive	Very excessive

Teleclasses for Mathematics

13. In general, the content of the teleclasses is:

______	______	______	______	______
Very insufficient	A bit insufficient	Adequate	A bit excessive	Very excessive

14. The quantity of exposition by the teleteacher is:

______	______	______	______	______
Very insufficient	A bit insufficient	Adequate	A bit excessive	Very excessive

15. The quantity of audiovisual materials (movies and slides) used in the teleclasses is:

______	______	______	______	______
Very insufficient	A bit insufficient	Adequate	A bit excessive	Very excessive

16. The legibility of graphics (drawings, signs, etc.) used in the teleclasses is:

1 2 3 4 5

17. What the audiovisual materials (movies and slides) contribute to the effectiveness of teleclasses is:

1 2 3 4 5

Teaching

18. The help that ETV could provide (at its maximum) in the teaching of mathematics:

1 2 3 4 5

19. The help that ETV, since its introduction, has given in the teaching of mathematics:

1 2 3 4 5

SCHOOL ______________________
TEACHER ______________________
GRADE ______________________
SUBJECT ______________________
THEME OF THE LESSON ______________________

TOWN ______________________
SCIENCE ☐ HUMANITIES ☐
TV ☐ NO TV ☐ ACT ☐ WB ☐
The teacher had prepared his class in advance: ☐ Yes ☐ No

DATE ______________________

TEACHER

1. Lectures
2. Dictates
3. Explains (Responding to Spanish question).
4. Asks procedure questions.
5. Asks memory questions to group.
6. Asks memory questions to individuals.
7. Asks opinion questions.
8. Asks thought questions.
9. Uses blackboard.
10. Uses demonstrations.
11. Uses audio-visual materials.
12. Directs exercises in groups.
13. Works individually with students.
14. Supervises student activity.
15. Suggests individual projects.
16. Reviews individual projects.
17. Assigns homework.
18. Assigns investigations as homework.
19. Checks homework.
20. Teacher behavior during Teleclass: ______________________
21. Student behavior during Teleclass: ______________________

STUDENTS

1. Ask procedure questions.
2. Ask memory questions.
3. Ask thought questions.
4. Go to blackboard.
5. Give opinions.
6. Take part in discussions.
7. Work in small groups.
8. Work individually.
9. Work on individual projects (chosen by students).
10. Repetition drill.
11. Question-answer drills.
12. Dramatizations.

INFORMATION ABOUT THE SCHOOLS AND COMMUNITIES

The Community Survey (cf. Ch. V)

The School

A. Building

1._____it is rented _____it is owned by the government

2. Date of construction________________________________

3. Construction material of the building___________________

4. Design as a school:

_____poor _____mediocre _____good

5. Sufficient lighting (natural or electric):

_____sufficient _____insufficient _____very insufficient

7. General conditions of the building:

_____poor _____mediocre _____good

B. Teaching Conditions

1. The noise from some classes or from physical education bothers other classes:

_____rarely _____sometimes _____frequently

2. Sufficient teaching materials:

_____sufficient _____insufficient _____very insufficient

3. Specific materials that are needed:

____

4. Quality of the teaching materials:

_____poor ____mediocre _____good

C. Classrooms

1. Number of classrooms:_______________

2. Taking into account the current number of students that use them, the size of the classrooms is:

_____too big _____too little _____just right

D. Desks

1._____they are owned by the Ministry _____owned by the students

_____owned by the Patronato (Local sponsoring group)

2._____there are enough _____not enough How many lacking_______

E. Facilities

_____there is a library for the teachers

_____there is a library for the students

_____there is a special room for the library

_____there is a laboratory

_____there are bathrooms

_____there is a recreation area

_____there is an area for physical education

_____there is an auditorium

_____there is a mimeograph machine

F. Location

1. The climate bothers the classes:

	In the morning	In the afternoon
rarely	_____	_____
sometimes	_____	_____
frequently	_____	_____
very frequently	_____	_____

2. The noise from outside the school bothers the classes.

_____rarely _____sometimes _____frequently _____very frequently

G. Administration

1._____Combined with an Institute[*] (in the same building)

_____Combined with a Primary School (in the same building)

_____Not combined with any other school

2. The number of students in the Third Cycle:_______________

In the morning: 7th_____ 8th_____ 9th_____

In the afternoon: 7th_____ 8th_____ 9th_____

3. The number of teachers in the Third Cycle:_______________

How many teach both morning and afternoon_______________

How many teachers short are you_______________

How many have to teach a subject outside their speciality___________

4. The number of classes in Third Cycle:_______________

In the morning: 7th_____ 8th_____ 9th_____

In the afternoon: 7th_____ 8th_____ 9th_____

H. The School Director

1._____permanent position _____temporary appointment

2. Sex_____

3. Experience:

How many years of teaching experience has he had___________

How many years experience as a director has he had___________

---

[*] An Institute is a senior high school

4. Training:

_____graduate of Normal School

_____graduate of Bachillerato

_____graduate of the Superior Normal School

5. Retraining:

_____a year at San Andres

_____three summers at San Andres

_____one summer at San Andres

_____none

6. Domicile:

_____lives permanently in the community

_____lives in the community only during the week

_____lives outside the community

7. What are the major problems the school has?

____

____

I. The Students

1. Where do the students come from?

_____all of them come from the city

_____the majority come from the city, others from the Cantones*

_____the majority come from the Cantones

2. Is the mix of students different in 7th than in 8th or 9th?________

In what way is it different_________________________________

3. Do you have problems with student conduct?

_____rarely _____sometimes _____frequently _____very frequently

---

*A Canton is an administrative division of unincorporated rural areas

4. Have you had time to organize extracurricular activities this year?

_____yes _____no

What kind	How often
____________________	____________________
____________________	____________________
____________________	____________________

5. Have you had more activities in past years?

_____yes _____no

If yes, why the change this year____________________________________

6. Do all of your 7th grade students come from one or from a number of primary schools?

_____all of them come from one primary

_____the majority come from one, but some come from other(s)

_____they come from a number, with: _____equal preparation

_____different levels of preparation

7. Have you had meetings with the parents group this year?

_____yes How many times____________________________

For what reasons____________________________

____

____

_____no

The Community

A. Available Education

1. Are there schools in the community where students can continue their education after Third Cycle?

_____there are commercial courses day_____ night_____

_____there is a Bachillerato day_____ night_____

_____there are no such schools

2. If there are no such schools in the city, are there such schools in the area where students can commute every day?

_____Commercial Schools day_____ night_____

_____Bachillerato day_____ night_____

_____there are no such schools

3. What are the graduates of last year doing?

_____% have looked for work

_____% have looked for work and begun to go to night classes in

_____the Bachillerato _____the Commercial School

_____% are going to the Bachillerato during the day

_____% are going to the Commercial School during the day

_____% other____

4. How easy is it for the graduates of Third Cycle to find work appropriate to the level of their education in this city?

	Men	Women
All can find work	_____	_____
The majority can find work	_____	_____
50% can find work	_____	_____
The majority can't find work	_____	_____
No one can find work	_____	_____

B. Accessibility

1. How long does it take to go by bus to (Santa Ana, Sonsonate, San Miguel, San Salvador)?

____

2. How many buses a day come here?________________

3. How long does it take to go by bus to San Salvador?________

4. How many buses go to San Salvador from here every day?______

5. How far is it to the closest paved highway?________

C. Specific Data

1. Is there a Bank here?_____

2. Is there a movie theater here?_____

3. What is the population?_____

4. How many private phones?_____

5. How many registered vehicles?_____

6. What is the percentage of paved streets in the city?_____

7. How many newspapers sold?_____

APPENDIX B

Extra Tables

TABLE A

Math Achievement Scores

Minimum N=	Cohort A (537) ITV	 (175) Trad.	Cohort B (413) ITV	 (90) Reform (No ITV)	Cohort C (434) ITV	 (124) Reform (No ITV)
7th Beg.	11.971	12.444	15.334	15.266	14.233	13.746
7th End	18.236	16.853	19.019	16.862	17.297	17.935
Gain	6.265	4.409	3.685	1.596	3.064	4.189
% Gain	52.3%	35.4%	24%	10.5%	21.5%	30.5%
8th Beg.	16.13	15.58	13.814	12.943	16.652	16.560
8th End	18.33	16.78	16.019	16.911	19.899	17.847
Gain	2.20	1.20	2.205	3.968	3.247	1.287
% Gain	13.6%	7.7%	16%	30.7%	19.5%	7.8%
9th Beg.	15.51	15.37	18.442	17.073		
9th End	18.66	16.06	23.386	20.832		
Gain	3.15	.69	4.944	3.759		
% Gain	20.3%	4.5%	26.8%	22.0%		

TABLE B

Science Achievement Scores

	Cohort A		Cohort B		Cohort C	
Minimum N=	(527) ITV	(178) Trad.	(425) ITV	(94) Reform (No ITV)	(444) ITV	(129) Reform (No ITV)
7th Beg.	18.059	19.282	20.720	21.074	19.474	19.154
7th End	24.768	21.412	25.974	23.319	23.698	22.605
Gain	6.709	2.13	5.254	2.245	4.224	3.451
% Gain	37.2%	11%	25.4%	10.6%	21.7%	18%
8th Beg.	25.195	21.225	22.410	20.028	22.518	20.783
8th End	26.794	23.581	24.971	23.408	22.592	21.227
Gain	1.599	2.356	2.561	3.38	.074	.437
% Gain	6.3%	11.1%	11.4%	16.9%	.3%	2.1%
9th Beg.	21.372%	18.068	25.921	22.850		
9th End	23.385	20.162	28.697	27.897		
Gain	2.013	2.094	2.776	5.047		
% Gain	9.4%	11.6%	10.7%	22.1%		

TABLE C

Social Studies Achievement Scores

	Cohort A		Cohort B		Cohort C	
Minimum N=	(527) ITV	(179) Trad.	(425) ITV	(94) Reform (No ITV)	(439) ITV	(123) Reform (No ITV)
7th Beg.	26.627	27.990	24.308	23.681	22.228	20.054
7th End	35.557	30.232	31.715	27.043	28.330	23.959
Gain	8.93	2.242	7.407	3.362	6.102	3.905
% Gain	33.5%	8.0%	30.5%	14.2%	27.5%	19.5%
8th Beg.	26.180	20.112	23.836	19.689	23.567	22.298
8th End	28.924	22.229	26.419	23.837	28.622	25.682
Gain	2.744	2.117	2.583	4.148	5.055	3.384
% Gain	10.5%	10.5%	10.8%	21.1%	21.4%	15.2%
9th Beg.	20.524	18.594	25.605	23.981		
9th End	21.748	21.754	26.741	24.710		
Gain	1.224	3.16	1.136	.729		
% Gain	6.0%	17.0%	4.4%	3%		

TABLE D

Correlations; Attitudes by Control Variables

ITV Subsample, Cohort B
(N≈400)

	Father	Wealth	Age	Sex	Urbanization	Gen. Abil. (March'70)
Learn More from ITV (10/70)	-.02	-.02	.07	-.01	.16	-.01
(10/71)	-.06	-.10	.09	-.03	.13	-.04
ITV More Difficult (10/70)	-.06	-.01	.09	.05	-.04	-.16
(10/71)	-.03	.03	-.05	.08	-.12	-.09
See ITV Clearly (10/70)	-.02	-.10	.08	-.06	.18	-.09
(10/71)	-.05	-.11	.16	-.11	.12	-.09
Teacher Prefers ITV (10/70)	.09	-.04	.04	.06	.15	-.03
(10/71)	-.00	.02	.03	-.04	.08	-.02

TABLE E

Correlations; ITV Attitudes by Control Variables

Cohort B (N≈400)

	Father	Wealth	Age	Sex	Urbanization	Gen. Abil.
Math ITV Attitude (3/71)	-.15	-.17	.16	-.07	.15	-.15
(10/71)	-.06	-.09	.12	-.01	.16	-.07
(10/72)	-.10	-.09	.10	.05	.08	-.06
Science ITV Attitude (3/71)	-.06	-.05	.05	-.08	-.01	.02
(10/71)	-.00	-.00	.08	-.01	.04	-.03
(10/72)	-.04	-.02	.00	.03	-.06	-.05
Social Studies ITV Attitude (3/71)	-.13	-.12	.13	-.04	.09	-.15
(10/71)	-.07	-.05	.04	.02	.10	-.09
(10/72)	-.13	-.07	.10	.02	.08	-.17

TABLE E - cont.

	Father	Wealth	Age	Sex	Urbanization	Gen. Abil.
English ITV Attitude (3/71)	-.08	-.09	.04	-.14	.18	.02
(10/71)	-.13	-.09	.10	-.06	.18	[illegible]
(10/72)	-.17	-.09	.06	-.22	.13	-.04
Spanish ITV Attitude (3/71)	-.08	-.14	.13	-.10	.15	-.14
(10/71)	.03	-.04	.09	-.09	.09	-.04
(10/72)	-.12	-.12	.12	-.12	.08	-.14

TABLE F

Correlations, Favorite Subject Attitudes by Control Variables

Cohort B ($N \approx 670$)

	Attitude towards Math	Attitude towards Science	Attitude towards Social Studies	Attitude towards English	Attitude towards Spanish
Gen. Abil. (3/70)	.09	.04	-.07	.11	-.22
Father	.01	.10	-.03	-.03	-.04
Wealth	-.00	.10	-.04	.02	-.09
Age	.05	-.10	.04	-.12	.15
Sex	.08	.10	.18	-.18	-.19
Mother	.02	.04	-.06	.02	-.04
Urbanization	-.01	-.13	.05	.02	.07

APPENDIX E

Research Reports on the El Salvador Educational Reform
and Television Project published by the
Institute for Communication Research
Stanford University
Stanford, California

1. First Meeting of the Advisory Committee. Administrative Report No. 1. October, 1968.*

2. Design of the Study. Research Report No. 1. December, 1968.*

3. The Use of Television in the El Salvador Program of Educational Reform: Differences between this Project and some others. Administrative Report No. 2. April, 1969.

4. The El Salvador Educational Reform: Some Effects of the First Teacher Retraining Course. Research Report No. 2. July, 1969. (Emile G. McAnany, Generoso Gil, Jr., Donald F. Roberts).*

5. Measuring Educational Development through Classroom Interaction. Research Memorandum No. 1. September, 1969 (Wilbur Schramm).*

6. Parents Talk about ETV in El Salvador. Research Memorandum No. 2. October, 1969. (Luis F. Valero Iglesias, Emile G. McAnany).*

7. "Feedback" for Instructional Television. Research Memorandum No. 3. December, 1969 (Wilbur Schramm).

9. Research and Evaluation in the El Salvador Project of Educational Reform: What is Being Tested and Why. Research Memorandum No. 4. January, 1970.*

10. Television and Educational Reform in El Salvador: Summary Report of the First Year of Research. Research Report No. 3. May, 1970. (Wilbur Schramm, Emile G. McAnany, John K. Mayo, Robert C. Hornik).

11. Television and Educational Reform in El Salvador: Complete Report on the First Year of Research. Research Report No. 4. July, 1970 (Emile G. McAnany, Robert C. Hornik, John K. Mayo).

12. Teacher Observation in El Salvador. Research Report No. 5. January, 1971 (Judith A. Mayo).

13. Feedback on Student Learning for Instructional Television in El Salvador. Research Report No. 6. February, 1971. (Ana Merino de Manzano, Robert C. Hornik, John K. Mayo).

14. Television and Educational Reform in El Salvador: Complete Report on the Second Year of Research. Research Report No. 7. March, 1971. (Wilbur Schramm, John K. Mayo, Emile G. McAnany, Robert C. Hornik).

15. An Administrative History of El Salvador's Educational Reform. Research Report No. 8. November, 1971 (John K. Mayo, Judith A. Mayo).

16. Instructional Television in National Educational Reform. Research Report No. 9. March, 1973 (Wilbur Schramm).

17. Television and Educational Reform in El Salvador: Report on the Third Year of Research. Research Report No. 10. March, 1972. (Robert Hornik, Henry Ingle, John K. Mayo, Judith A. Mayo, Emile G. McAnany, Wilbur Schramm).

18. Television and Educational Reform in El Salvador: Report on the Fourth Year of Research. Research Report No. 11. May, 1973. (Henry Ingle, Yolanda Ingle, Robert C. Hornik, John K. Mayo, Emile G. McAnany, Wilbur Schramm).

19. Television and Educational Reform in El Salvador: Follow-up Study on the First Group of Ninth Grade Graduates. Research Report No. 12. June, 1973. (Henry Ingle in cooperation with Jose Velasco and Victor Zelada).

20. An Observation Study of Two Classrooms. Research Report No. 13 (in preparation). (Yolanda Ingle).

*Out-of-print

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12. Teacher Observation in El Salvador. Research Report No. 5. January, 1971 (Judith A. Mayo).

13. Feedback on Student Learning for Instructional Television in El Salvador. Research Report No. 6. February, 1971. (Ana Merino de Manzano, Robert C. Hornik, John K. Mayo).

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